Pit and Quarry

With which is consolidated

CEMENT-MILL & QUARRY

September, 1935

NRA U.S. CODE GRAPHIC ARTS INDUSTRY 1934

APR 30 1936

Vibraloy

THE SCREEN "MATE" FOR VIBRATORS

Abrasive Resisting Wire Cloth

Vibraloy is alloyed and designed specially for Vibrating Screens and the Aggregate Industries; economical for screening trap rock, coarse stone, sand, gravel, coke ores, etc. **HARD**—Vibraloy is so hard that it is difficult to file, thus it resists grinding, scouring abrasion, even under wet conditions, but it is not hard enough to be brittle. **SPRINGY**—Vibraloy is resilient, but rigid enough to prevent sagging. **TOUGH**—Vibraloy is strong to withstand heavy fast moving loads and impacts. **ARC-LOCK CRIMP**—Initial accuracy of screening is maintained throughout the life of the screen by interlocking weave.

WRITE NOW FOR THIS NEW CATALOG

ROL-MAN

A TRUE MANGANESE STEEL

SCREEN CLOTH

– Welding Rods –
Forgings–Plate Products

Our new 56-page Catalog No. 40-3 describes our complete line of Arc Loc Crimp, Double Crimp, Woven Slot, Welded Slot and Rolled Rectangular Opening Space Wire Cloth in Vibraloy Abrasion Resisting Steel, Plain Steel and other metals and contains specifications and list prices for all square openings from 6 inch with 1½ inch rods to the finest mesh, in Double Crimp, Plain and Filter Weaves; Flexible Wire Cloth in various types for Conveying Belts is also fully covered in this catalog. . . . It is worthy of a place in your permanent file for it answers every "usual" and "unusual" problem in Space Wire Cloth and Fabricated Screening Units ready for installation, etc., etc. **Write for Catalog 40-3 today; no cost or obligation.**

Inquiries for Rol-Man Screen Cloth, etc., the champion for low cost per ton screening service, should be addressed to the Manganese Steel Forge Co., at the same address below.

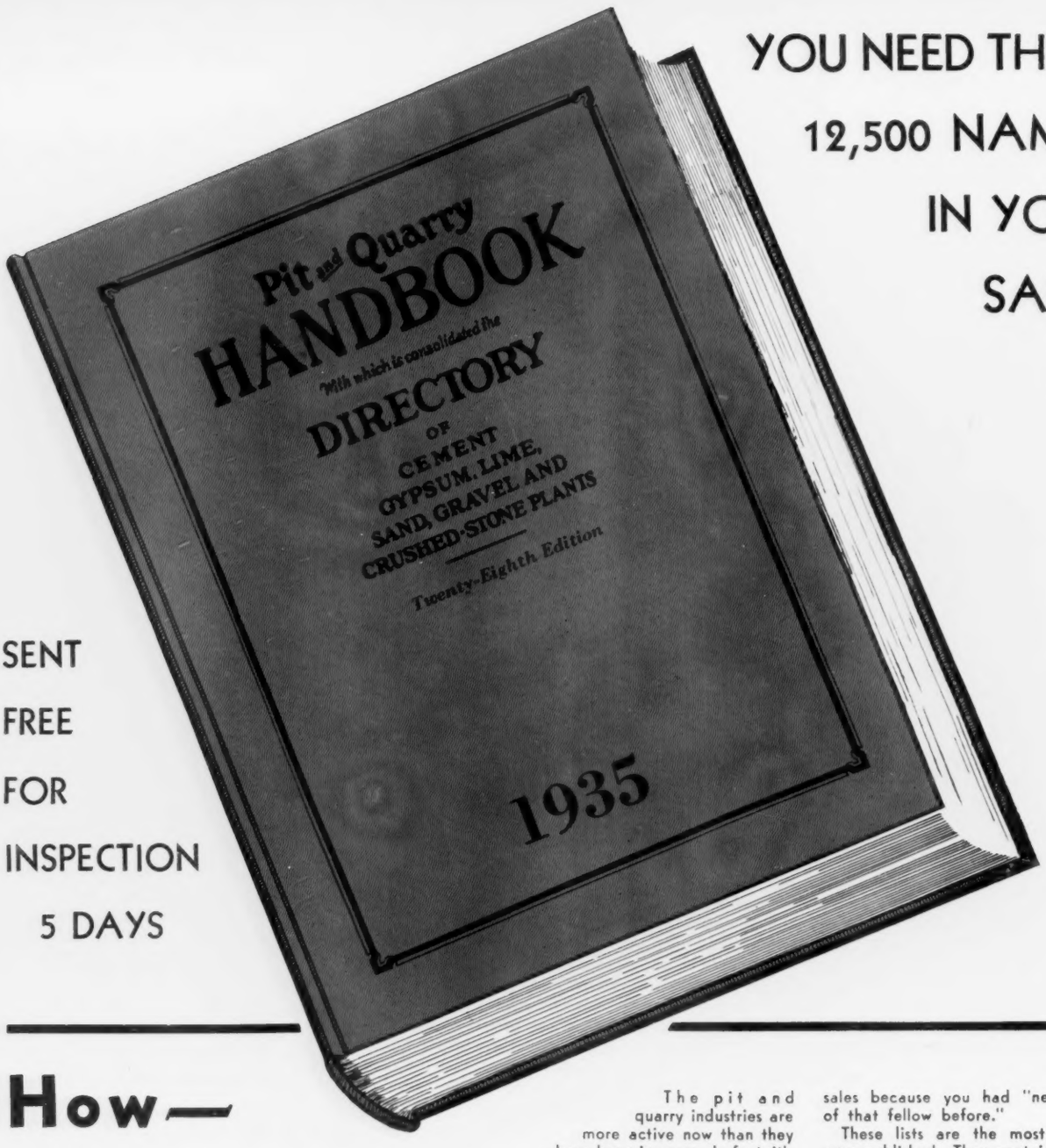
AUDUBON WIRE CLOTH CORPORATION

A Subsidiary of the Manganese Steel Forge Company

Castor Ave., Allen & Bath Sts. Philadelphia, Pa., U. S. A.

★ Pages 15-21

YOU NEED THESE 12,500 NAMES IN YOUR SALES KIT



SENT FREE FOR INSPECTION 5 DAYS

How—

—accurate and complete are your prospect lists?
—much "deadwood" is there on your prospect lists?
—much do you know about your prospects?
—much do you waste per year on poor lists?
—many "not there" calls do your men make?
—much do you know about new developments?

The pit and quarry industries are more active now than they have been in years. In fact, it's one of the most active fields in industry. It's natural. For before the roads, dams, bridges, buildings, etc., can be built under the public works program the raw material has to be furnished.

Get your share of it. Don't miss fire with poor prospect lists. Don't lose sales because you had "never heard of that fellow before."

These lists are the most complete ever published. They contain hundreds of new names. They have been completely revised—all listings have been brought up to the minute.

Regardless of whether your territory covers only one state or the whole country the investment in a copy of Pit and Quarry Handbook is something that will pay big dividends—in sales.

To Delay Is to Lose Sales—The Field Is Active—It Is Buying—Order This Selling Helper Today

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☐ Send ..... copies of the 1935 Pit and Quarry Handbook and Directory ($10.00 per copy).

☐ Send ..... copies of the separately bound Pit and Quarry Directory ($10.00 per copy).

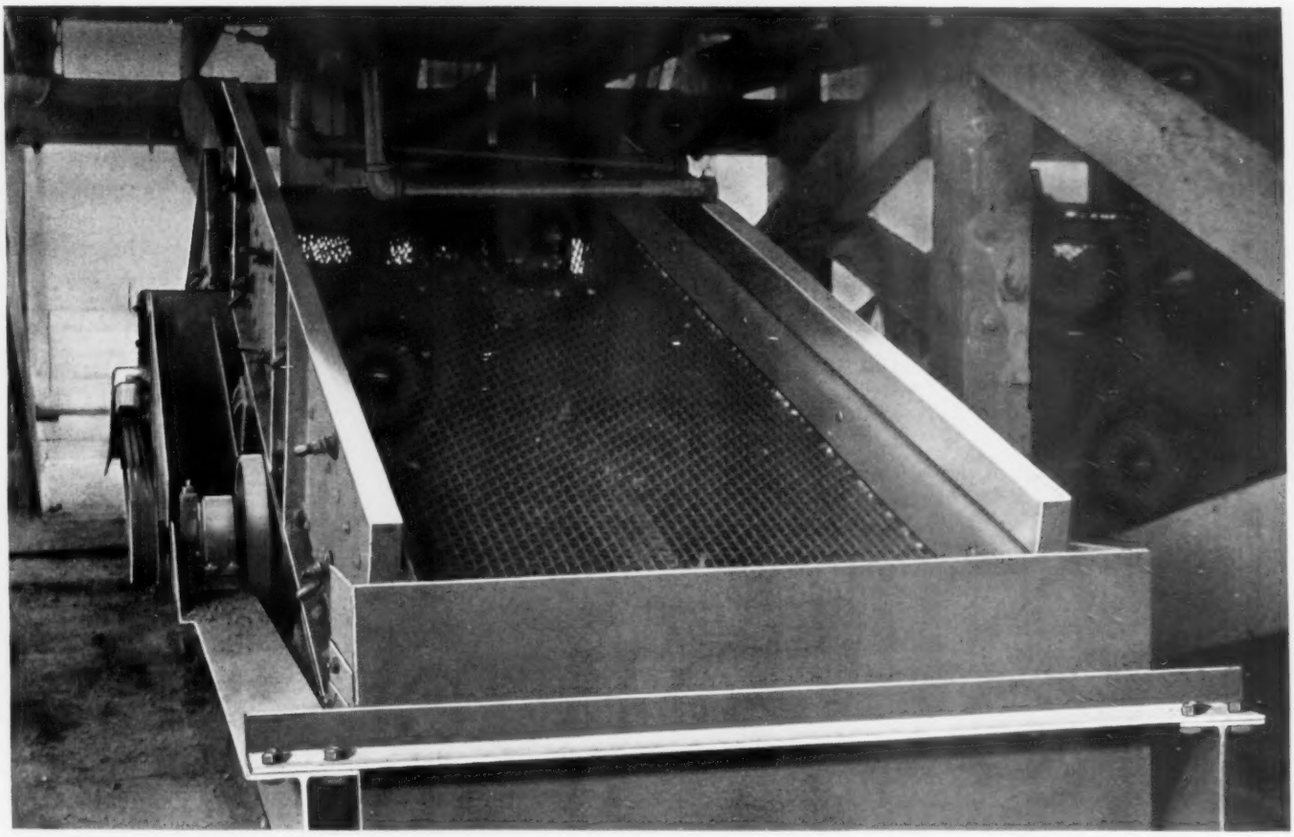
☐ Remittance Enclosed. ☐ Will Remit Promptly on Receipt of Invoice.

My Name ..... Title .....

Firm .....

Address 9-35

Effective Screening



THE Link-Belt vibrating screen is the ideal screen for low-cost grading of rock products. It is truly, "a triumph of mechanical vibration," noted throughout the industry for its high efficiency, simplicity of construction, high capacity, long life and thorough reliability.

The full force of the vibrating impulses is transmitted equally to all parts of the screen. Thus, open meshes are maintained and an even flow of materials over the surface is assured. The result is effective screening. Send for Book No. 1462.

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS ATLANTA SAN FRANCISCO TORONTO

Offices in Principal Cities 5410

LINK-BELT Vibrating Screen

AFR -1 1936 ©CIB 296344

Pit and Quarry

With which is consolidated
CEMENT-MILL & QUARRY

Volume 28 SEPTEMBER, 1935 Number 3

MEMBER AUDIT BUREAU OF CIRCULATIONS

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other non-metallic minerals. Entered as second-class matter November 28, 1932, at the Postoffice at Chicago, Ill., under the Act of March 3, 1897.

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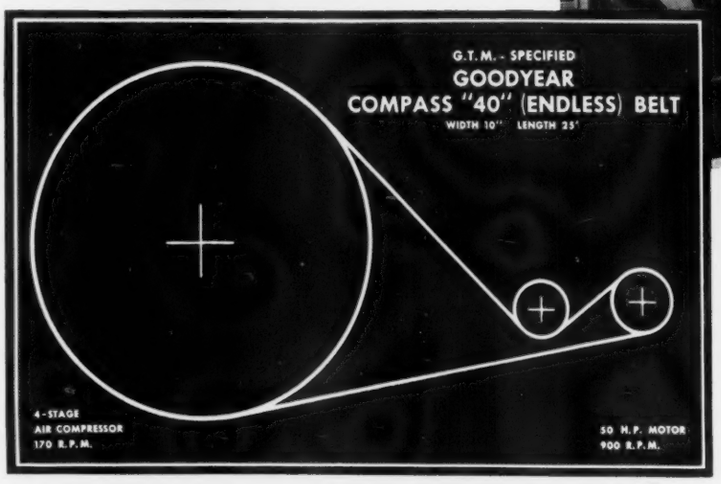
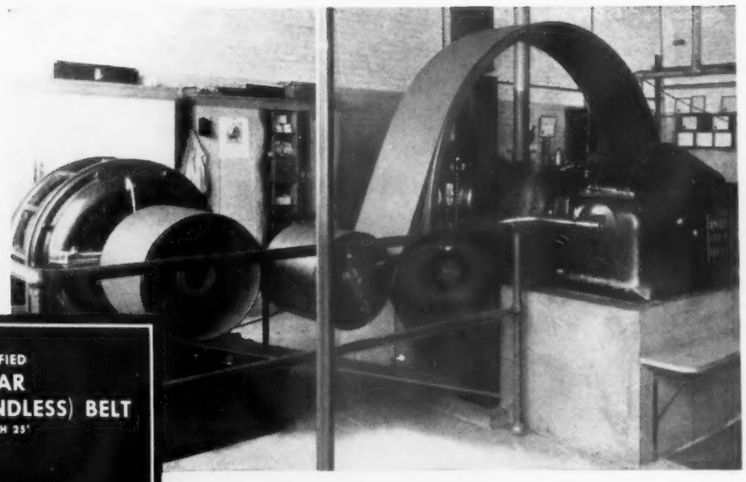
NRA U.S. CODE GRAPHIC ARTS INDUSTRY 1934

BELTS
MOLDED GOODS
HOSE
PACKING

MADE BY THE MAKERS OF GOODYEAR TIRES





"IT WAS A LUCKY DAY WHEN WE BOUGHT A GOODYEAR COMPASS BELT"

HERE is a typical example of the cost-reducing service Goodyear COMPASS (Cord) Endless Belts are delivering on industry's most difficult drives.

Five years ago a large manufacturer was having continuous belt trouble on his four-stage air compressor, driven by a 50 h.p. motor at 900 r.p.m. Belt-stretch was the biggest difficulty, necessitating many adjustments.

Then the G.T.M.—Goodyear Technical Man—was called in. After his usual careful analysis, he recommended a Goodyear COMPASS "40" Endless Belt, 10″ in width by 25′ long.

No Stretch in Five Years

This belt has now been in service nearly five years and has operated more than 12,000 hours. In all this time it has never given a moment's trouble, and has not stretched a single inch—*being exactly the same length today as when installed.*

No wonder this customer says: "Considering the trouble we had with other belts, we feel it was a lucky day when we bought a Goodyear COMPASS!"

The GTM Can Help You

The secret of COMPASS' superlative performance is its exclusive endless cord construction that eliminates ply-separation trouble and *insures long life* under severe tension. It is the most nearly stretchless belt made.

If you have a belt-killing drive, consult the G.T.M. about COMPASS—let him specify the correct type for your service, *and watch trouble vanish.* To have him call, write Goodyear, Akron, Ohio, or Los Angeles, California — or the nearest Goodyear Mechanical Rubber Goods Distributor.

THE GREATEST NAME IN RUBBER

GOODYEAR

RAYMOND PRESENTS

The Greatest Advance in Pulverizing Equipment in Thirty Years . . . .

RAYMOND now offers industry a better and cheaper method of making powdered materials through the development of the BOWL MILL — a radical improvement over present-day pulverizing equipment in design and results.

It is built around an entirely new grinding principle that increases production efficiency — and reduces wear, vibration and noise by eliminating metal-to-metal contact in pulverizing. Its distinctive feature is a revolving bowl, or grinding chamber, which insures constant movement of the material by centrifugal action. There are never any "dead zones" in the mill. As soon as the feed enters the bowl, it is thrown against the inclined sides and forced between the rolls and the grinding ring until reduced fine enough to pass into the air separator.

This produces rapid reduction of the material with minimum consumption of power and record low costs per ton of product. For long runs at sustained capacity, unusual economies are shown in pulverizing coal, limestone, gypsum and other non-metallic minerals and manufactured products.

BOWL MILLS are available in sizes from one to twenty tons per hour for a fineness range of 10 to 325-mesh material — for all general industrial applications, and for direct-firing coal to boilers, furnaces and kilns.

BOWL MILL NON-STOP SERVICE

for **uninterrupted, trouble-free operation for 24 hours a day, month after month, without shutdowns**

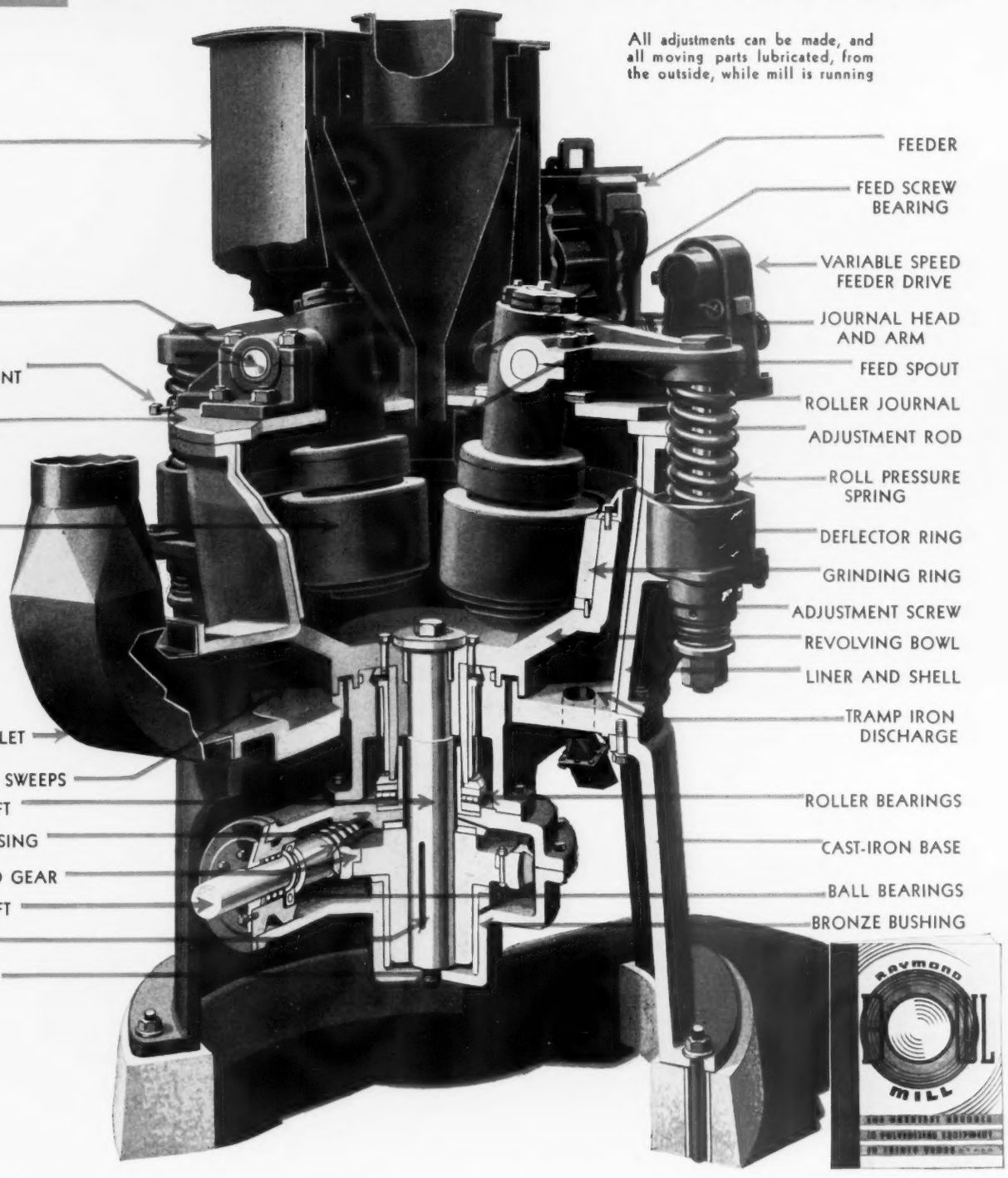
RAYMOND BROS. IMPACT

1321 NORTH BRANCH STREET, CHICAGO

Sales Offices in All Principal Cities

THE BOWL MILL

All adjustments can be made, and all moving parts lubricated, from the outside, while mill is running



Patents Pending

Bulletin on Request

PULVERIZER COMPANY

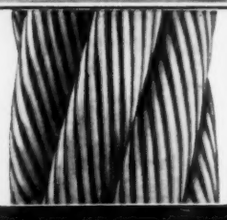
Division of Combustion Engineering Company, Inc.

Canadian Representative: Combustion Engineering Corporation, Ltd., Montreal

THE TIME FOR "DIAGNOSIS"

. . is before the rope is used

"HOPE" may rhyme with "rope"—but all the "hope" in the world can't make the "wrong" rope do a particular job right. It's safer—and more economical—to leave "hope" to the "second-guessers"—to choose the wire rope that's "prescription-made"—from type to grade—to do the particular job it's been built for. Such a rope is American Steel & Wire Company Tiger Brand Wire Rope—backed by more than a century of experience—the rope that out-performs all other brands—insuring steadier operating output with less time out for repairs—providing a tested type and size wire rope for every specific operating condition. Wherever shovels dip, derricks swing and cranes lift—wherever wire rope carries on reliably—you'll find Tiger Brand—the largest selling wire rope in the world—putting dependability on the job.



Tiger Brand Wire Rope is available in Standard (non-preformed) or Excellay (preformed) constructions.

Use Tiger Wire Rope Clips—identified by their yellow base.

TIGER BRAND
REG. U. S. PAT. OFF.
WIRE ROPE

AMERICAN STEEL & WIRE COMPANY

208 S. LA SALLE STREET, CHICAGO • • EMPIRE STATE BUILDING, NEW YORK

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

Offices in All Principal Cities

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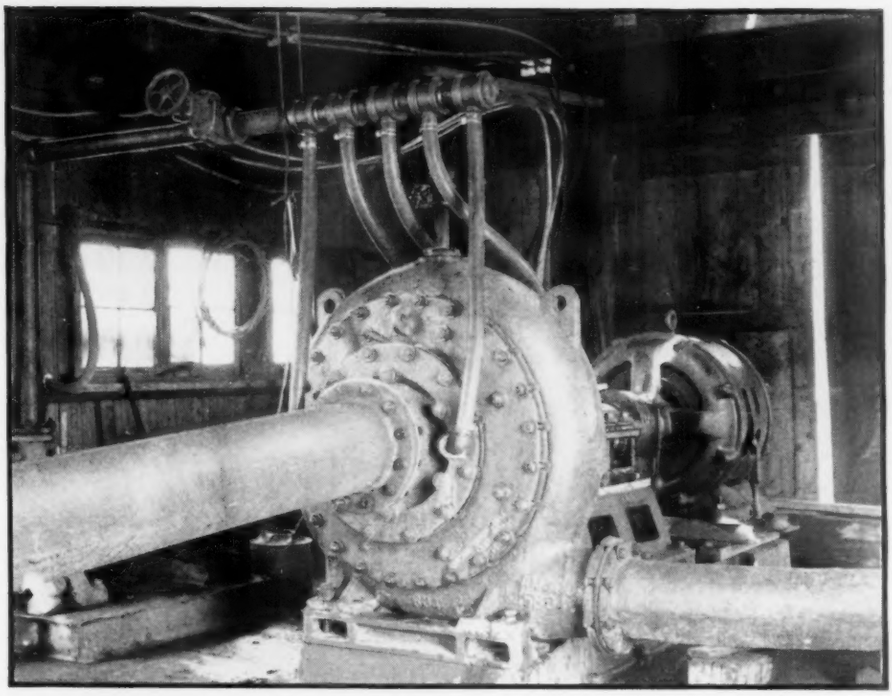
United States Steel Corporation Subsidiary



8-inch AMSCO, Type "M", Heavy Duty Sand and Gravel Dredge Pump, Right Hand, Bottom Discharge, equipped with two-way thrust bearing and latest design water end parts incorporating the high efficiency impeller of funnel mouth construction; directly connected to an electric motor, slip ring design for variable speed operation. This is the pump used by the Shenk Brothers Gravel Company at their Durand, Michigan plant.

AMSCO SAND AND GRAVEL DREDGE PUMPS

Assure . . .

Economical and Dependable Production Results

AMSCO Dredge Pumps comprise the latest and most practical features developed in accordance with conditions encountered in actual dredging practice. They are carefully designed to meet all the requirements of sand and gravel pumps.

The continued success of AMSCO Dredge Pumps is due to a policy of building with quality, assuring Durable Construction and Lasting Efficiency.

AMSCO Pumps reflect their ability to stand up when being pressed the hardest for production. They assure maximum protection against operation shutdowns and require minimum cost of repair parts and repair labor. Users of AMSCO pumps will tell you this.

The shell, impeller, side plates and renewable liners are made of the analytically controlled, scientifically heat-treated AMSCO Manganese Steel, the "Toughest Steel Known", which provides the highly essential resistance to impact shock, wear and abrasion. All parts are moulded with heaviest, properly proportioned metal sections and conform to soundest engineering design, embodying distinctive AMSCO features, providing easy flow passages which give maximum hydraulic efficiency and solids capacity.

AMSCO Pumps are built in standard 3-inch, 4-inch, 5-inch, 6-inch, 8-inch, 10-inch, 12-inch, 16-inch and 18-inch sizes for all types of drives.

We invite your inquiry for performance data and details on the type of AMSCO Pump best suited to your operations

AMERICAN MANGANESE STEEL COMPANY

Division of American Brake Shoe & Foundry Company

396 East 14th Street

Foundries at Chicago Heights, Ill.; New Castle, Del.; Denver, Colo.; Oakland, Cali.; Los Angeles, Calif. • Offices in Principal Cities

Chicago Heights, Illinois

AMSCO

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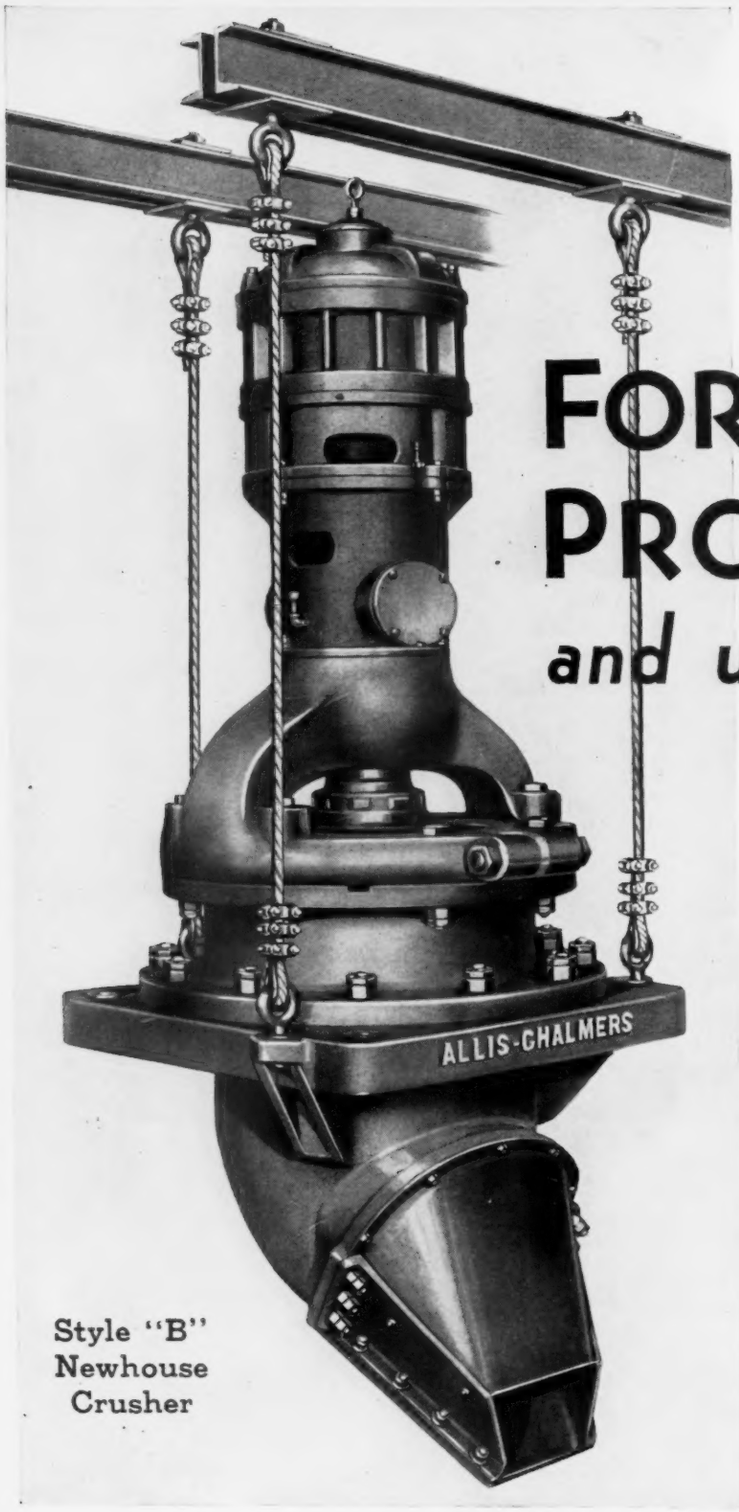


Style "B" Newhouse Crusher

FOR GREATER PRODUCTION

and uniform product

NEWHOUSE Crushers, with their short rapid crushing action, meet the industry's requirements for large capacities, high reduction, and uniform product. The large unobstructed receiving openings permit easy feeding. The drive is direct by an electric motor mounted above the crusher spider. There are few working parts, all readily accessible, and no gears or belts.

Reversible, non-choking concaves are furnished as standard equipment except for small feed and fine product. A new type of dust seal positively prevents leakage of oil and prevents dust or water from entering the eccentric bearing.

This crusher unlike all others does not require an expensive permanent foundation. It is suspended from the plant structure by means of three cables that not only support the crusher, but also absorb the vibration and shock of crushing and prevent it from being transmitted to the supporting structure.

We would like to show you operating records of these modern crushers and how they have saved money in many crushing and mining plants. Get in touch with the nearest Allis-Chalmers office.

ALLIS-CHALMERS

— Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, U.S.A. —

THERE'S *Long Life* IN REPUBLIC CONVEYOR BELTING

★ Each Republic Conveyor Belt is a thoroughly tested product before it leaves our plant. All manufacturing processes are scientifically controlled to produce a belt that conforms with Republic's Higher Established Standards as applied to the special requirements of each application. These standards have been adopted out of our long experience with all types of conveyor belt operations. Records of scientific tests on each belt are maintained in our files and they must prove that Republic's Standards have been met.

Republic Conveyor Belting is made to satisfy the needs of extremely rugged and abusive industrial operations. It will give long life in the face of heavy loads, the abrasion and cutting action of sharp, rough materials, exposure to the elements and the never ceasing stresses and strains of continual use. It is one of the noted quality achievements of the rubber industry.

Our engineers will gladly confer with you and give dependable advice concerning any type of conveyor belt application.

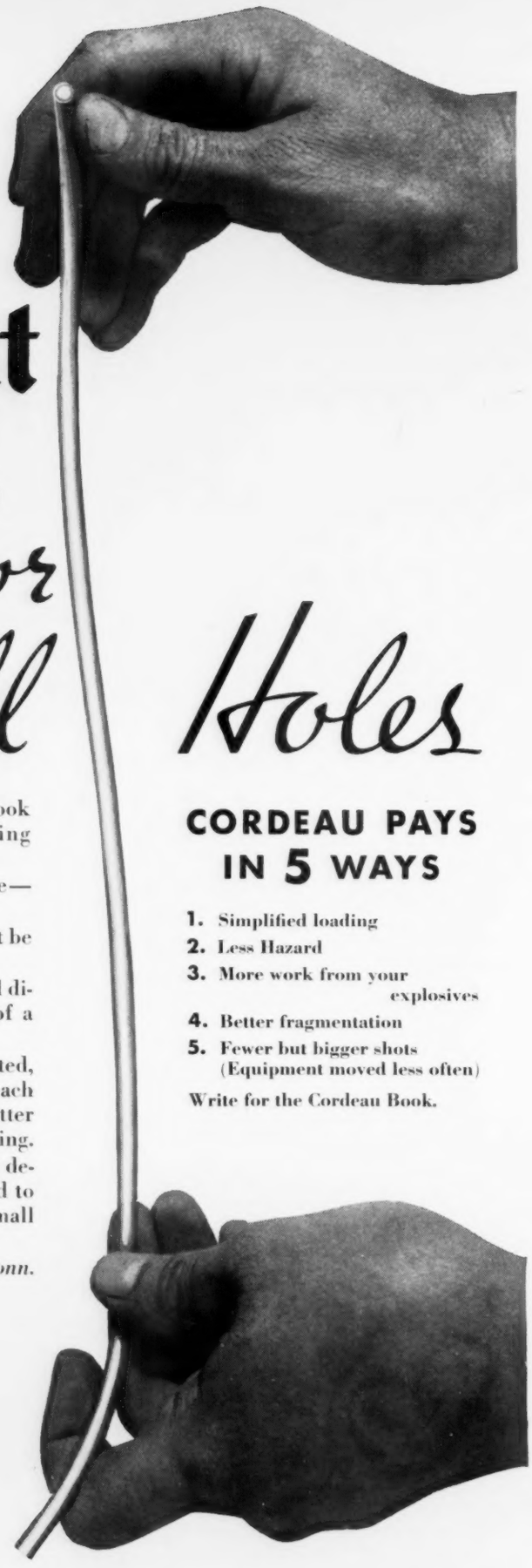
THE REPUBLIC RUBBER CO.

YOUNGSTOWN, OHIO

MECHANICAL RUBBER PRODUCTS FOR EVERY INDUSTRIAL REQUIREMENT

ORDER REPUBLIC RUBBER PRODUCTS FROM YOUR DISTRIBUTOR

Let's Look at Cordeau -/- for Well Drill Holes



Big holes, big powder—a big job any way you look at it. But the use of Cordeau-Bickford Detonating Fuse means:

Simplified Loading: No cap in the cartridge—Cordeau itself is the detonator.

Less Hazard: Cordeau is insensitive—it must be detonated in order to detonate!

More Work: Each cartridge, being detonated directly by the Cordeau, has the added force of a primer cartridge.

Thousands of well drill holes, Cordeau detonated, can "go" as one giant blast, yet be so planned that each row relieves the burden for succeeding rows. Better fragmentation means easier removal—easier crushing.

Send for the Cordeau Book. It illustrates and describes a technique in blasting that can be applied to Jackhammer and Wagon Drill holes too, for small shots as well as larger ones.

THE ENSIGN-BICKFORD COMPANY, *Simsbury, Conn.*

CORDEAU PAYS IN 5 WAYS

1. Simplified loading
2. Less Hazard
3. More work from your explosives
4. Better fragmentation
5. Fewer but bigger shots (Equipment moved less often)

Write for the Cordeau Book.

CORDEAU
DETONATING FUSE
BICKFORD
ALSO SAFETY FUSE *Since* 1836

CB 46

THE ENSIGN-BICKFORD COMPANY

BUILT TO MAKE A PROFIT FOR THE LOW BIDDER!

This Austin-Western No. 100 mounted on rubber for fast transportation is, for its capacity, the most compact unit on the market. It has a 9" x 40" jaw crusher and a reduction roll crusher. (See illustrations below.)

● The advantage of genuinely low operating costs with Austin-Western Crushing, Screening and Washing Plants is two-fold: Not only are they the basis for bids which win contracts, but they carry through the job to yield the expected profit.

Low costs in producing aggregate are chiefly a matter of steady, efficient operation. Long practical experience with the stresses involved has been put to good use in the designs. Freedom from breakdowns reaches a high point in Austin-Western Equipment.

This construction is equally desirable to permanent plant operators or construction companies producing stone on or near the job.

Write, or send the coupon for details on equipment shown or other types.

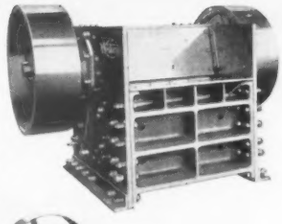
The Austin-Western Road Machinery Co.

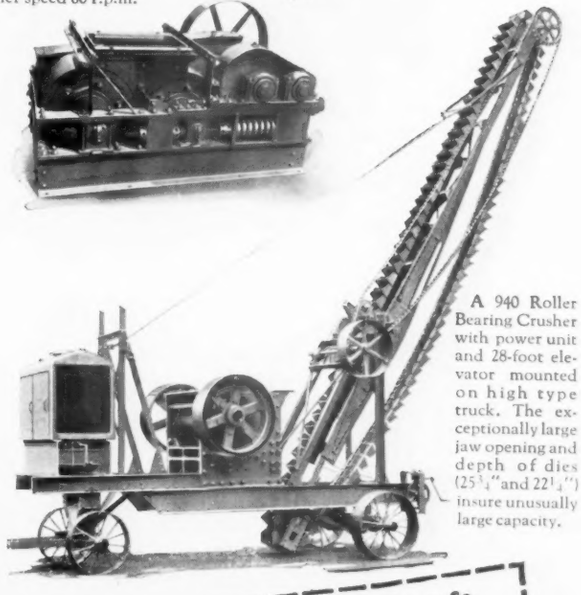
Home Office: Aurora, Illinois Cable Address: AWCO, Aurora

Branches in 14 Principal Cities

The 940 Primary Breaker will operate at full capacity without delay or trouble. Self-aligning roller bearings reduce friction, save on horsepower, and reduce lubrication costs.

The Austin-Western 3018 Roll Crusher uses 50 gasoline horsepower. Roller diameter (with 2" manganese shells) 30"—face 18". Roller speed 60 r.p.m.





A 940 Roller Bearing Crusher with power unit and 28-foot elevator mounted on high type truck. The exceptionally large jaw opening and depth of dies (25¾" and 22¼") insure unusually large capacity.

The Austin-Western Road Machinery Co.
Aurora, Illinois

Please tell me more about your ☐ complete plants; ☐ washing and screening plants; ☐ jaw crushers; ☐ 3018 roll crusher.

Name.....

Address..... State..... 4-6

City.....

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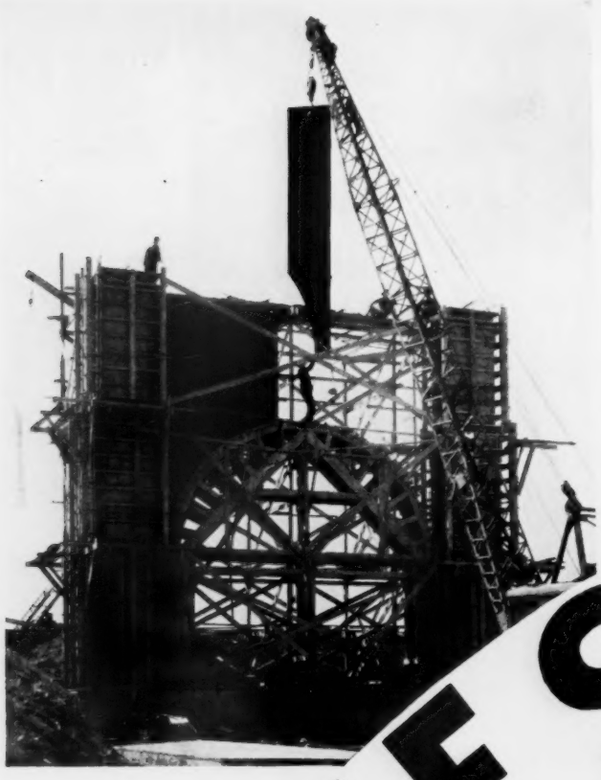


Don't let your wire rope problems "Get" you. Thousands of operators will tell you, you can positively obtain the utmost satisfaction and surprisingly long service if you will switch right now to

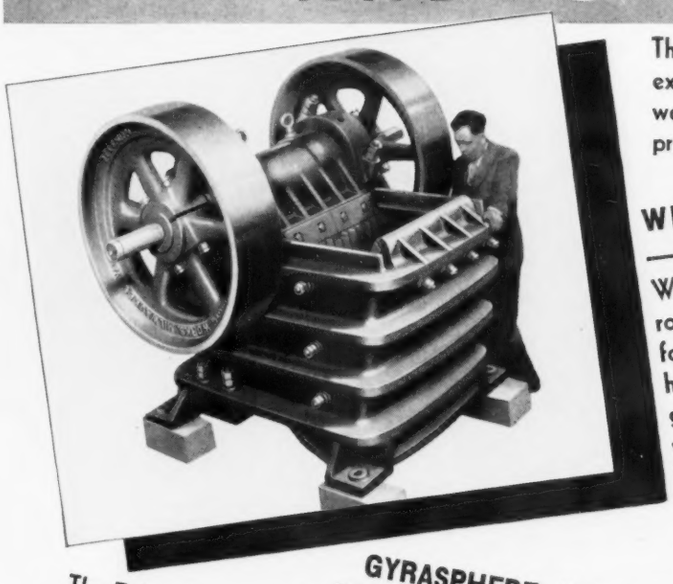
PURPLE STRAND

Williamsport

Wire Rope Company

Main Office and Works: Williamsport, Penna. Branch Sales Offices: 122 S. Michigan Ave., Chicago

GREATER SPEED
LARGER CAPACITY
AND LOWER UP-KEEP



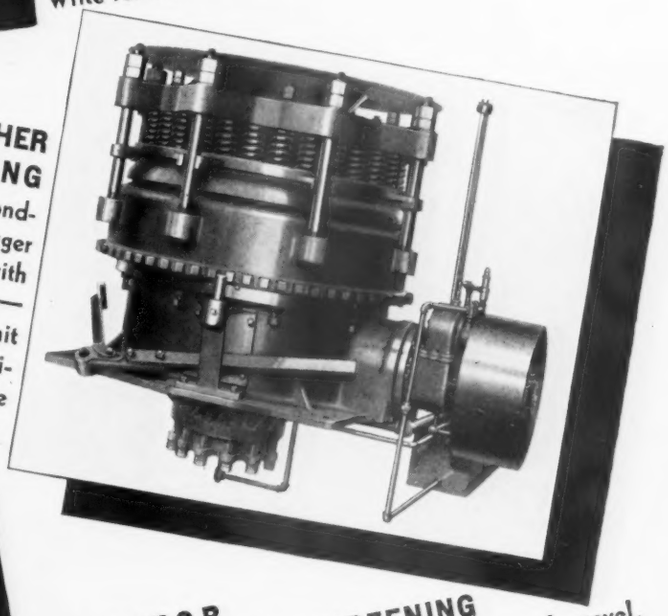
This 3-piece combination of Telsmith equipment is a striking example of group efficiency. Modern in every sense of the word . . . each piece is designed and built to better the product and cut operating costs.

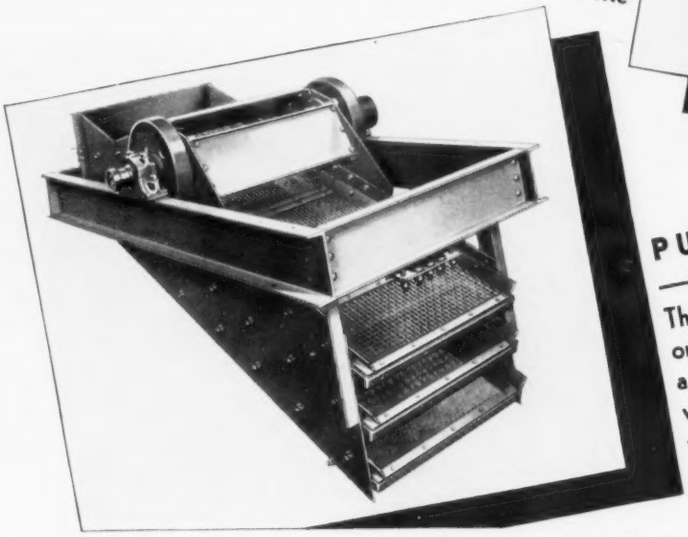
WHEELING JAW CRUSHER —FOR COARSE CRUSHING

With its compact, rugged steel structure and cylindrical roller bearings, the Telsmith-Wheeling Jaw Crusher is ideal for coarse crushing. The roller bearings, force feed and higher speed almost double the capacity without any greater expenditure for power. Simple adjustment allows wide sizing range. Up-keep is reduced to a minimum. Write for Bulletin W-15.

GYRASPHERE CRUSHER —FOR FINER CRUSHING

The Telsmith Gyrasphere takes the trouble out of secondary crushing. Working at choke feed, it turns out a bigger tonnage and more cubical product—crushes finer, with low power consumption and up-keep. The reasons—spring relief, rotary head support, spherical head, unit spring design, anti-friction thrust bearings, pressure lubrication, improved distribution of crusher pressures. Write for Bulletin Y-15.





PULSATOR —FOR EFFICIENT SCREENING

The Telsmith Pulsator screens crushed rock, sand, gravel, ore or coal . . . wet or dry. Its circular movement produces a maximum screening action, uniform on every inch of the wire, on every deck, under any load. The toughest alloy steels, the finest anti-friction bearings and special labyrinth and piston ring steels (to protect working parts) give longer life and lower up-keep. Write for Bulletin V-15.

M-3

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130 S. 15th Street ..... Philadelphia, Pa.
605 Statler Bldg. ..... Boston, Mass.
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SMITH ENGINEERING WORKS
504 EAST CAPITOL DRIVE, MILWAUKEE, WIS.

TELSMITH

CONSERVE THE STRENGTH OF YOUR ROPE

Know your Ropes ...This is a helpful hint, how to make wire rope last longer. Subsequent Wickwire Spencer advertisements in this publication will give other dollar saving information. Tell us about your rope problem and we will give you the answer.

A wire rope loses in breaking strength when it is bent over a sheave. If the sheave is relatively small in relation to the rope diameter, the loss in strength is considerable. With sheaves of greater diameter, however, the loss becomes so slight that it is hardly worth considering. Proper diameter of sheaves minimize the loss of rope strength from bending. We will gladly send you a table showing the proper relationship between rope and sheave diameters. Write today and request this or any other information that may be of help to you in making rope live longer.

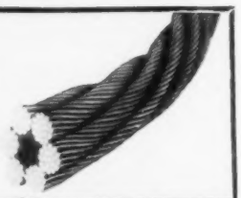
•

WICKWIRE SPENCER STEEL COMPANY, New York City; Buffalo, Chicago, Worcester; *Pacific Coast Headquarters:* San Francisco; *Warehouses:* Portland, Los Angeles, Seattle. *Export Sales Department,* New York City.

WIRE ROPE
by Wickwire Spencer

BOTH...STANDARD LAY AND WISSCOLAY PREFORMED.

Wickwire Spencer manufactures all sizes and types of Wire Rope in standard lays and preformed. Wisscolay preformed wire rope will often solve a wire rope application difficulty. Ask our engineers where and when it should be used. Send for a free WIRE ROPE BOOK. It will prove of great value.



VOLUME 28 NUMBER 3

Pit and Quarry

With which is consolidated

CEMENT-MILL & QUARRY

CHICAGO, SEPTEMBER, 1935

July Contract Volume Over Total for June

RESIDENTIAL FIELD ACTIVE

The construction total for July exceeded the monthly volume reported for any other month since March, 1934, when the PWA was at its peak. According to F. W. Dodge Corp. the contract total for all classes of construction reported for July in the 37 eastern states amounted to $159,249,900. During June the volume was $148,005,200 while in July of last year the total was only $119,662,300.

The chief item of significance in the July record is to be found in the continued activity in the residential field, as distinguished from other classes of construction. For residential building, the July total amounted to $48,371,800; this was almost 2½ times the volume reported for July, 1934. The residential total for July slipped about 3 per cent. from the June contract volume of $49,832,600 but that is less than is customary at this season of the year.

Improvement in residential building over July, 1934, was shown in each of the major geographic areas east of the Rocky Mountains with the sole exception of the New Orleans Territory (Louisiana and Mississippi combined). The largest relative gains were reported in the Middle Atlantic States, the Southeast, the Chicago Territory and the Kansas City District.

For the first seven months of 1935 residential construction contracts in the 37 eastern states totaled $256,545,400. This is in excess of the total for all of 1934 and compares with a total of only $151,592,500 for the corresponding seven months of last year.

Despite the large improvement in residential work the contract total for all classes of construction covering the first seven months of this year is less than that reported for the corresponding period of 1934. A year ago the total was $973,764,200; this year's total was $855,756,700.

Ohio Lime Plant to be Completely Remodeled

★ The plant of the National Mortar & Supply Co. at Gibsonburg, O., is being remodeled at a cost of $150,000. Five large steel bins will be erected to take the place of the present wooden ones in use and a lime pulverizing unit will be installed.

Settlement Ends 6-Week Lime Strike in Alabama

A 6-week strike of 400 workers at four lime plants in the Shelby County district of Alabama has been settled and the employees have gone back to work. The strike had been called July 1 by the I.U.M.M.S.W. The companies affected were the Longview-Saginaw Lime Works, Alabaster Lime Works, Cheney Lime & Cement Co., and Keystone Lime Works.

Building New Minnesota Roofing Granule Plant

★ The Emeralite Surfacing Products Co. of Ely, Minn., have begun the construction of a new roofing granule coloring plant at Ely, replacing the plant destroyed by fire last February with a loss of over $75,000. The company also produces crushed stone.

Fort Peck Cement Order Goes to Universal Atlas

The plant of the Universal Atlas Cement Co., at Duluth, Minn., has received another order to furnish cement for the Fort Peck dam. The order calls for 310,000 bbls. of special specification cement.

New Ohio Gravel Plant to Supply Muskingum Dam

★ The Zanesville Gravel Co. of Dresden, O., has added an Owen bucket to the equipment at the company's new plant near Conesville, O. The plant is a dragline operation with a 1½-cu.yd. Sauerman dragline bucket operating in the Muskingum river. The company is furnishing gravel for the Wills Creek Dam of the Muskingum watershed program.

★ Martin Joyce of Parker, S. Dak., has purchased a Pioneer Gravel Equipment Mfg. Co. portable plant and has been operating it near Sioux Falls and Brookings, S. Dak.

Merger of Universal-National Gypsum Near

STOCK EXCHANGE COMPLETED

The amalgamation of the Universal Gypsum & Lime Co. of Chicago, Ill., and the National Gypsum Co. of Buffalo, N. Y., was considered a certainty when more than 51 per cent. of the common and preferred stocks of Universal were deposited in exchange for stock of the National Gypsum Co. The primary step in the merger has been made, leaving many details and changes to be made when officials of both firms become accustomed to the new conditions. The combination of these two companies will make the National Gypsum Co. the second largest producer of gypsum in the country.

Central Silica Co. Buys Second Shovel in 90 Days

★ The Central Silica Co., Zanesville, O., recently purchased a 1-cu.yd. Osgood heavy-duty shovel for use at one of its silica plants. This is the second new shovel purchased by this company within 90 days.

Blaze Destroys Ohio Quartz Products Plant

The main manufacturing unit of the plant of the Ohio Quartz Products Co., at Jackson, O., was destroyed by fire July 26, at an approximate loss of $75,000. Two-thirds of the loss was covered by insurance. The plant was virtually new, having been completed in 1931.

Builders Mat. Co. Enters Concrete Mixing Field

★ The Builders Material Co., Cedar Rapids, Ia., operator of permanent and portable crushed stone and sand and gravel plants, recently became a producer of ready-mixed concrete. Equipment purchased included several Jaeger truck mixers and Johnson bins and batchers.

★ The Carbola Chemical Co., Inc. has installed two 14-ft. Gayco Reliance separators for classifying talc at its plant at Natural Bridge, N. Y.

F H A Reports Steady Progress in Building

ESTIMATES REVISED UPWARD

Dealers in building supplies, who have been benefited by the notable revival of building activity in the first six months of the year, can look ahead with gratifying anticipation for good business during the latter six months of the year, according to the Federal Housing Administration.

Estimates made at the beginning of the year as to the extent of building recovery for 1935 have been revised upward as increases are recorded for residential building. Progress has been uninterrupted since the first of the year. Along with the new building under way has been added a steadily increasing volume of modernization work made possible by the extension of credit by financial institutions approved by the F.H.A.

Throughout the month of July the greatest progress yet recorded by financial institutions in modernization credit extended and mortgages insured under the Mutual Mortgage Insurance Plan of the F.H.A. is announced by Acting Administrator Stewart McDonald. The last day of July showed the largest daily volume of business by these private lending institutions.

Insured modernization and repair notes for the day of July 31 amounted to $2,144,710. For the month of July they totalled $21,084,565. For the entire period of operation since the Modernization Credit Plan was begun in August, 1934, they amounted to $113,-071,642. Notes for amounts of more than $2,000 insured under the amended provisions of the National Housing Act, are not included in these totals.

That new residence building will go on apace during the latter six months of the year is indicated by the increased number of home builders who are financing their operations under the Mutual Mortgage Insurance Plan of the F.H.A.

Mortgages selected for appraisal with fees paid for the day of July 31 amounted to $1,242,355. They totalled $32,712,769 for the month of July and for the entire period of operation since the Mutual Mortgage Insurance Plan began to function last December they totalled $122,518,711.

All the money advanced under both the Modernization Credit Plan and the Mutual Mortgage Insurance Plan is private capital released by private financial institutions to individuals and business concerns through the insurance provided by the F.H.A. In addition the general program has directly stimulated cash modernization work estimated by field directors of the F.H.A. at more than $670,000,000.

These figures bring the grand total of insured modernization and repair notes and mortgages selected for appraisal to $3,387,420 for the largest day, to $53,797,325 for the largest month, and to a grand total of $235,-590,353 for both parts of the Federal Housing Administration program.

Three views showing damage done to plant of Pennsylvania-Dixie Cement Corp. at Portland Point, N. Y. by a flood on July 7. Because of a plentiful supply of cement on hand at the time the only serious delay to shipments was caused by the fact that 5 miles of railroad was washed out and nearly 2 weeks was required to restore service.

Permanent Plant Owner Adds Semi-Portable Unit

★ Louis Ebbe of Waupaca, Wis., who has operated a stationary gravel plant for many years, has purchased a Telsmith semi-portable gravel plant.

New York to Hold Road Lettings Every 2 Weeks

It has been announced that the state of New York, starting Sept. 4, will hold a letting every two weeks until the entire amount allotted for public works, $20,000,000, is used. Producers feel that a large part of this work will carry over into 1936 and are optimistic over future prospects of the aggregate industries.

Illinois Quarry Operator Makes Plant Improvement

★ The Jersey Quarry Co., Jerseyville, Ill., which Mrs. George Hoffstetter operates, is making extensive improvements and installations of equipment at its quarry just south of Fieldon, Ill. Other improvements are contemplated at the company's quarry north of Fieldon.

★ An Austin-Western No. 100 portable crushing and screening plant mounted on 6-wheel dual-pneumatic rubber tires, was purchased by the Northwestern Engineering Co. of Lander, Wyo.

Build 13,337 Miles of Roads in Past 2 Years

4,000 MI. UNDER CONSTRUCTION

During the fiscal years 1934 and 1935 a total of 13,337 miles of highways was completed, according to a report of United States Bureau of Public Roads. About 4000 miles more are under construction and 675 miles approved for building. Figures cover highways outside of municipalities. Cost of the completed roads is given as $201,675,656, of which $178,825,369 was from public work funds, and the remainder supplied by the states. Roads under construction are estimated to cost $88,262,779, of which $78,327,210 was charged against Federal appropriations. The balance remaining for new projects is $11,-136,810.

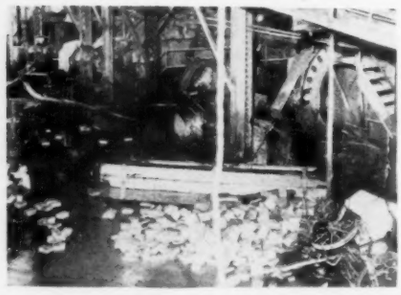
Highways constructed into and through municipalities covered a total of 1903 miles, at a cost of $103,763,295, while 508 miles of similar roads are under construction at a cost of $45,-040,286. The Bureau has approved construction of 134.4 miles to cost $8,-737,197, and there is a balance of $13,-917,668 still remaining for the construction of this type road.

Missouri Producer Builds Gravel Plant in Arkansas

★ The Southwest Sand and Gravel Co., recently completed the construction of a new sand and gravel plant on Crooked Creek near Pyatt, Ark. A drag-line delivers the material to the plant, and approximately 800 tons of gravel per day is the capacity of the plant. C. D. Denton, of Springfield, Mo., is president of the firm and C. J. Denton is superintendent of the new plant.

The Tennessee-Arkansas Gravel Co., of Arkansas City, Ark., has moved its plant from Rosedale, Miss., to Arkansas City, Ark.

★ A new ready mixed concrete company has been organized by George G. Toler of Ada, Okla. The firm has purchased two Chevrolet trucks, each mounted with a 1½ cubic yard Jaeger mixer. At present two batching plants have been provided, one in Ada and the other at Fittstown.

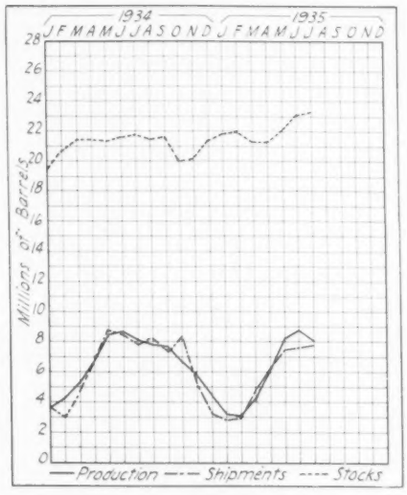


July Cement Output Slightly Under 1934

SHIPMENTS GAIN OVER JUNE

The Portland cement industry in July, 1935, produced 8,021,000 barrels, shipped 7,813,000 barrels from the mills, and had in stock at the end of the month 23,291,000 barrels. Production of Portland cement in July, 1935, showed a decrease of 1.5 per cent. and shipments a decrease of 1.1 per cent., as compared with July, 1934. Portland cement stocks at mills were 6.6 per cent. higher than a year ago.

The statistics here given are compiled from reports for July, received



Cement production, shipments and stocks to July 1935.

by the Bureau of Mines, from all manufacturing plants except one. The mill value of the shipments—31,934,000 barrels—in the first half of 1935, is estimated as $49,317,000. According to the reports of producers the shipments totals for the first half of 1935 include approximately 945,000 barrels of high-early-strength Portland cement with an estimated mill value of $1,812,000.

Nevada Portable Plant Has Tires and Brakes

★ George W. French, Jr., of Moapa, Nevada, has recently purchased an Austin-Western No. 100 portable crushing and screening plant mounted on pneumatic tires and equipped with vacuum brakes.

North American Plant at Alsen Celebrates Safety

A clambake was held by the employees and officials of the plant of the North American Cement Corp., of Alsen, N. Y., at Asbury, N. Y., in celebration of the completion of the first six months of 1935 without a lost-time accident. The speakers of the day were C. R. Parker, treasurer of the company and Dr. George Branch, plant physician. Other officials who attended the gathering were J. J. Porter, president; T. J. Hart, vice-president, G. A. Witte, superintendent of the plant, and Thomas Wright of the New York State Construction Council.

Cowell P. C. Co. Awards Dust Collector Contract

★ The Cowell Portland Cement Co. has awarded a contract to the Western Precipitation Co., Los Angeles, Cal., for dust arrestors to be installed at its plant at Cowell, Cal. According to W. H. George, general manager of the cement company, the contract must be fulfilled by April 1, 1936. A court decision handed down in April of this year had caused the plant to be shut down on June 1 but the company was later given permission to reopen Nov. 15. The company has been given until May 1, 1936 to abate the dust nuisance charged in the suit.

Great Lakes Rededicates P. C. Assn. Safety Trophy

A rededication of the safety trophy awarded by the Portland Cement Assn. to the Great Lakes Portland Cement Corp., Buffalo, N. Y., was held July 7, as a result of another year without a lost-time accident. Speakers included: Adam L. Beck, president of the company; Lieut. Col. Henry A. Reninger, Lehigh Portland Cement Co.; and the Rev. Wm. T. Brown, Hamburg, N. Y. The annual outing of the company was held in conjunction with the ceremonies at Chestnut Ridge Park. The 600 persons attending were served barbecue and other refreshments.

New Bins and Equipment Added to Indiana Plant

★ A new bin for the storage of lime is now under construction at the plant of the Ripley County Construction Co. at Osgood, Ind. New machinery will also be added to the present equipment.

Settlement Ends Strike at Canadian Gypsum Co.

The strike of the employees at the plant of the Canadian Gypsum Co., at Guelph, Ont., has come to an end as the result of a satisfactory settlement between the employees and employers.

Charles Bussen, who operates stone quarries at St. Genevieve, Mo., purchased the towboat "Wolverine" from C. M. Andres, trustee for the bankrupt Penglase Sand & Gravel Co.

★ The Hector Construction Co., of Hector, Minn., has purchased one of the largest Pioneer Gravel Equipment Mfg. Co. portable plants operating in the dry construction field.

N. Y. State Cr. St. Assn. Plans Summer Meeting

HAVE INTERESTING PROGRAM

The New York State Crushed Stone Assn. announces that its annual midsummer meeting will be held Sept. 11, at the Schuyler Meadows Golf and Country Club, Loudonville, Albany, N. Y. After a short but important business meeting at 11:30 a.m. luncheon will be served. The afternoon will be devoted to golf, approaching, putting and driving contests and other forms of entertainment. It is announced that members of the State highway and public works commissions will be guests.

Producer Adds Equipment for Agricultural Stone

★ The Rockford Stone Co. has added a new centrifugal roller kiln mill to the equipment of its plant at Rockford, O. Dolomite rock from the crushing plant is fed to the centrifugal mill where it is dried by a blast of heated air and blown to a cyclone dust collector. The products of the mill will be used in agricultural fields.

Illinois Producer Gets Two Large Gravel Awards

The Western Sand and Gravel Co., of Spring Valley, Ill., has received two large orders for gravel, one for 35,000 tons and the other for 40,000 tons. The gravel will be used on the roads in Sparta and Walnut Grove Townships.

Vibrating Screen Added to New Blast Sand Plant

★ The Andersen Sand & Gravel Co., Saginaw, Mich., has installed a 4-ft. by 8-ft. double-deck Symons screen in its new blast sand plant at Juniata, Mich.

Acme Cement Co. Plans to Continue Plant Promotion

The Acme Cement Co., Los Angeles, Cal., announces that the plans for the erection of a large cement plant in Los Angeles and a smaller plant at Whitewater, Cal., would be carried on in spite of the recent death of Aman Moore, president of the company. Mr. Moore had gone East to complete the financing of these projects.

★ The Texas Sand and Gravel Co. recently purchased a Bonnot reduction crusher for one of its plants near Amarillo, Tex.

★ A Pioneer Gravel Equipment Mfg. Co. 15-35 Duplex plant is now being operated by the Tomlison-Arkwright Construction Co., at Harlowtown, Mont.

Indiana Holds Letting on New Road Projects

WORK TO BEGIN IMMEDIATELY

The State of Indiana has provided employment for hundreds of people this fall by rushing through its $6,000,000 federal-aid highway program. Bids on approximately a quarter of the program will be received this week, James D. Adams, chairman of the state highway commission, announced on August 28, and other lettings will follow as rapidly as projects are approved by the U. S. Bureau of Public Roads.

The speed with which the highway commission is moving to get the $6,000,000 program under contract and construction is due to the advance planning which resulted in a complete program being ready for tentative approval as soon as the bureau was ready to consider projects. Final approval on work to cost approximately $1,750,000 was obtained and these projects advertised for bids within seven days after tentative approval on the program was received.

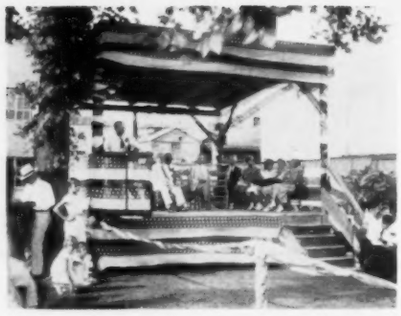
Huron P. C. Co. Building New Silos at Saginaw

★ The Burrell Engineering and Construction Co., is building six new concrete silos at Saginaw, Mich., for the Huron Portland Cement Co., of Detroit, Mich. The silos are being built at a cost of $40,000, and when completed will be 80 ft. in height, 26 ft. in diameter and will have a storage capacity of approximately 50,000 bbl. of cement. This will be a new unit in the distribution system of the cement company.

Dedicate P. C. A. Safety Trophy at Speed Plant

The plant of the Louisville Cement Co. at Speed, Ind., on August 3 celebrated the operation of the entire year 1934 without a lost-time accident. After the ceremonies attending the dedication of the new Portland Cement Assn. safety monument games and contests provided entertainment. Supper was also served to those attending. P. N. Bashnell represented the Portland Cement Assn. at the dedication.

New safety trophy unveiled at Speed, Ind. plant of Louisville Cement Co.



Ceremonies attending the safety trophy dedication at Speed, Ind.

Michigan Gravel Plant Adds Cement Block Unit

★ The Dowagiac Sand and Gravel Co., of Dowagiac, Mich., has recently installed a new machine for the manufacturing of cement blocks. The machine turns out on the average of 600 cement blocks per day.

Superior P. C. Co. Passes 2,000-Day Safety Mark

The Concrete, Wash., plant of the Superior Portland Cement Co., of Seattle, Wash., was awarded a certificate of merit by Gov. Clarence D. Martin for its outstanding safety record. The plant has operated 2,000 working days without an employee suffering a lost-time accident. There are said to be only six other cement manufacturing plants in the country with a comparable record.

Kansas Producer Builds Plant Under Difficulties

★ A 25-ton crusher unit of the Quartzite Stone Co., of Lincoln, Kan., was upset off a truck on which it was being moved to the new plant of the company. It was necessary to dismantle the crusher before it could be placed on the truck again and moved to the new plant.

Virginia Company Lets Contract for Lime Plant

★ The Shenandoah Lime & Stone Corp., Orlando, Va., has given a contract to Lime & Hydrate Plants Co., York, Pa., for the construction of a complete Kuntz system for the manufacture of hydrated lime. Equipment will include primary crusher, hydrator, beater mill, separator, elevators, conveyors, tanks, etc.

★ Fred G. Redmon of Yakima, Washington, has installed a new 2436 Pioneer primary crusher at his plant near Leavenworth, Wash.

Penn. Stone Prod. Assn. Holds Summer Meeting

HIGHWAY OFFICIALS ARE GUESTS

The annual mid-summer meeting of the Pennsylvania Stone Producers Assn. was held Aug. 23 at the Hotel Hershey, Hershey, Pa. The meeting began with a luncheon at noon after which A. T. Goldbeck, Director of the Bureau of Engineering of the National Crushed Stone Assn., described tests of local aggregates being made in the laboratories at Washington. A number of State highway officials were also present to discuss current problems as well as the future highway program. The afternoon was devoted to swimming, golf, and other sports.

New Kentucky Stone Plant Makes Water Shipments

★ The Caldwell Stone Co., Inc., of Danville, Ky., is now operating its new plant at Boonesboro, Ky. The plant is equipped with a 40 by 10-in. Good Roads crusher, a No. 6 Telsmith crusher, a 1-cu.yd. Northwestern shovel, and conveyors. The company also has one boat and four barges as the majority of the material produced at this plant is transported by water.

American Road Builders Plan Old Fashioned Show

The American Road Builders' Assn. announces that an "old-fashioned" Road Show will be held during the week of January 20, 1936 in Cleveland, O. According to Charles Upham, engineer-director of the association, members of the highway industry and profession welcomed the return of the type of big show which was formerly held. The members of the board of directors of the manufacturers' division of the association had expressed their opinion that the time was ripe for a show of this kind. A request for opinions of members of the industry resulted in an overwhelming vote for such a show.

The association announces that applications for exhibit space at the show are already being received. It is also announced that benefits will accrue to exhibitors who are manufacturer members of the A.R.B.A. as of October 1, 1935. These benefits are reduction in price of space and discount on exhibit services.

The plant of the Olympic Cement Co., Ltd., at Bellingham, Wash., has resumed operations giving employment to about ninety-five men.

★ The Standard Concrete Products Co., York, Pa., recently improved its plant by the installation of a Niagara screen and an A. D. Cook deep-well turbine pump.

Walsh Hour and Wage Bill Passed by Senate

ADD BACON-DAVIS AMENDMENT

The United States Senate, on August 12, passed and sent to the House of Representatives the Walsh bill empowering the government to impose maximum-hour and minimum-wage standards upon all those contracting with it. The bill applies to all contracts financed, even in part, by federal loans, grants or appropriations, whether made by governmental units or private parties using government funds. It also forbids the employment of convict labor or persons under sixteen years of age in carrying out such contracts.

The determination of the wage and hour standards to be required is left in the hands of the President or his agents, and he is given power to require of a contractor a pledge that he will apply these standards to his entire production until June 30, 1937, or for the duration of the contract. The provisions of the law apply also to subcontractors and material men.

Penalties for violation include cancellation of the contract or subcontract and the withholding of payments due. Such payments would be subject to claim by underpaid workmen, who are also given the right to sue against a contractor's bond. A principal contractor may relieve himself of liability with respect to persons not on his own payroll by requiring certificates of compliance from subcontractors and material men, but must cancel a subcontract when so ordered.

The Walsh bill is, in effect, an extension of the NRA codes to all government contracts. It is aimed at both construction contracts and those for supplies and materials used by the government, principally the latter. It is new legislation designed to keep the government from doing business with those attempting to cut wages.

An amendment to the old Bacon-Davis act was passed by the Senate Aug. 1. This applies only to government construction and repair contracts over $2,000. It provides for predetermination of prevailing wage rates and their application to government construction, guards against "kick-backs," and puts force in the old Bacon-Davis act, which was weak in the enforcement provisions.

Construction of National Parkway Is a Possibility

The National Park Service, Washington, is investigating the possibilities of a national parkway from New England to North Carolina and maybe deeper into the South. The Shenandoah National Park, with its Skyline drive; the Great Smoky Mountain Park, and the parkway link connecting them would be a working base for the projected highway, it is said. The Government has made available $5000 for a preliminary survey to determine the possibilities of a parkway from Washington to New England.

New Ohio Gravel Plant to Supply Muskingum Dams

★ The Ohio Valley Sand Co., Inc., of Parkersburg, W. Va., have built a new gravel plant near their present plant at New Martinsville, W. Va. A three drum National hoist, a 140-ft. Barber-Greene steel frame conveyor, and General Electric motors have been installed in the new plant. The old plant is being doubled in size in preparation for furnishing material to be used on the Muskingum project.

Slide Causes Severe Loss to Pennsylvania Producer

Owners of the Stephens-Jackson Co. slate quarry, Pen Argyl, Pa., suffered a severe loss recently when thousands of tons of debris caved into the quarry carrying with it considerable equipment and several buildings. Fortunately the slide occurred at night and no one was injured. A similar slide eight years ago cost the company about $60,000 to remove.

Oregon Producer Installs New Crusher and Screens

★ Theo. Arenz of Portland, Ore., has recently added a 2436 primary crusher and 2 3-ft. by 10-ft. double-deck Pioneer vibrating screens to his plant located some distance from Portland.

Penn-Dixie Celebrates Record at Georgia Plant

The employees and officials of the Clinchfield, Ga., plant of the Pennsylvania-Dixie Cement Corp., on July 19 held a barbecue in celebration of completing another year without a serious accident at this plant.

The New York office of the United States Gypsum Co. is now located on the forty-fourth floor of the RCA Bldg., Rockefeller Center.

Minnesota Road Plan Gets Federal Approval

TO BUILD 700 MI. TRUNK ROADS

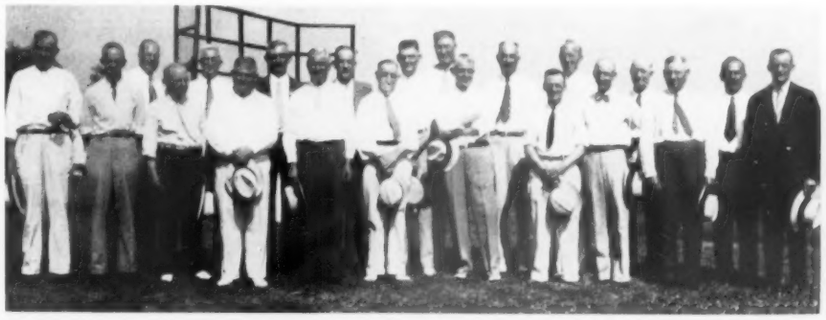
A year's program of nearly 700 miles of trunk highway construction, submitted to the United States Bureau of Public Roads recently by the State Highway Commission of Minnesota, has been aproved by federal authorities. Approximately $6,300,000 will be required to carry out the approved projects, of which the national government will pay half in the form of regular, matched federal aid. A list of additional projects involving about $500,000 is awaiting federal approval and will complete the program.

The highway department will begin letting contracts for the work whenever the State Executive council authorizes the sale of highway bonds to meet the state's share of the cost. This method of financing was provided by the last Legislature. Another construction program of equal size can be carried on next year by the matching method, as Minnesota has been alloted nearly $7,000,000 of regular federal highway aid for 1935 and 1936.

Included in the program already approved by the federal roads bureau is 120 miles of concrete paving, 216 miles of grading with gravel lifts, 220 miles of heavy gravel surfacing, 22 miles of bituminous surfacing, 19 bridges and a quantity of miscellaneous work.

The Carolina Sand & Gravel Co., Augusta, Ga., has taken over and is operating the new plant formerly operated by the Columbus Sand & Gravel Co. at Kathwood, S. C. Material from this pit, according to F. I. Gibson, vice president and general manager, is at present being furnished to the Arundel Corp. which is building the Savannah Bluff lock and dam in the Savannah River just below Augusta. Officers of the new company, in addition to Mr. Gibson, are: C. G. Fuller, president; Calhoun Lemon, secretary and treasurer.

★ John D. Gregg, of Whittier, Cal., is reported to have begun the erection of a rock crushing plant at 9228 Farmdale Ave., in the Van Nuys district.



Group of "old-timers" who were the center of attraction when the Universal, Pa. plant of the Universal Atlas Cement Co. recently rededicated its P.C.A. saftey trophy. The total length of service of these 21 employees amounts to 577 years. The plant had a perfect safety record in 1934.

PWA Projects Under Way Total Nearly 2 Billions

CITE NATIONAL SURVEY FIGURES

A report to Administrator Ickes on July 29 showed that PWA has under construction more than 4,500 federal and non-federal projects costing nearly $1,800,000,000. The report of the PWA Division of Economics, which has just completed a national survey of the public-works program, indicated that 13,238 projects, costing $685,421,693, have been completed and are in use. At present 4,514 projects, costing $1,787,187,135, are under construction, and 1,426 projects costing $321,026,225 have received allotments and are in various stages of progress preliminary to actual construction.

Prior to July 1, PWA spent $1,550,000,000 almost entirely as wages, which does not include such executive and special allotments as: $400,000,000 to CWA, $323,362,000 to CCC, $262,000,000 to FERA, and $100,000,000 to FCA. Of the $1,550,000,000 indicated as having been expended for wages, $1,000,000,000 went for material and provided secondary employment. Wages totaling $485,000,000 were paid on construction sites of PWA projects, while $65,000,000 was spent largely as wages for those employed in other phases of the program.

PWA has under construction 1,555 non-federal projects, the estimated cost of which is $729,802,193. These do not include federal housing projects but are of the type for which PWA is now receiving applications for loans and grants. At present 2,130 applications amounting to $501,114,249 have been reported.

The number of PWA applications received in Washington has shown a marked increase as the state offices, under the recently decentralized PWA examination procedure, act upon requests of communities.

California Stone Producer Adds Crushing Equipment

★ A new 18 by 24-in. McLanahan & Stone Corp., Steelstrut quick adjustment jaw crusher has been installed at the plant of the El Dorado Limestone Co. at Shingle, Cal.

O. C. Ralston Heads U.S. Nonmet. Experiment Sta.

Announcement of the appointment of Oliver C. Ralston, of Clarkdale, Ariz., as supervising chemical engineer, of the Nonmetallic Minerals Experiment Station, of the Bureau of Mines, Department of the Interior, at New Brunswick, N. J., is made by John W. Finch, director of the Bureau of Mines. Mr. Ralston succeeds Dr. Everett P. Partridge, who resigned to enter private employment.

Mr. Ralston entered the service of the Bureau of Mines in 1912. When the United States entered the World War, he resigned to engage in technical supervision of the manufacture of munitions at Niagara Falls, N. Y. After the War, Mr. Ralston returned to the Bureau of Mines, where he remained for eight years, acting for some time as supervising engineer of the Pacific Experiment Station, Berkeley, California. For the past seven years, he has been director of research for the United Verde Co. at Clarkdale, Ariz.

Mr. Ralston now reenters the service as supervising chemical engineer of the New Brunswick Station and will also have charge of chemical investigations looking toward the development of the important nonmetallic minerals at other experiment stations of the Bureau of Mines.

Planned Public Works May Exceed Available Funds

It is reported that municipal plans for public works are rising to a volume greater than PWA can possibly finance. More than 3,000 project applications have been filed with PWA for grants and loans totaling $750,000,000. State PWA directors anticipate that twice as many more will be submitted within the next six weeks.

The PWA has forwarded for President Roosevelt's approval 974 applications for 45 per cent. grants on projects estimated to cost $306,603,343. Applications for 287 projects to cost $55,466,863 had been approved to August 16.

WPA work programs have been submitted for every state except Nevada and totaled $837,509,000 August 16. Allotments totaling $234,435,000 had been approved for 33 states and approximately $170,000,000 had been actually released. Employment on WPA state projects is estimated at 133,000 while that on federal projects is estimated at 27,000.

Codes to Aid Prevention of Industrial Diseases

According to a statement recently issued by the American Standards Association, work is being begun on codes for the prevention of industrial diseases, especially those caused by the inhalation of toxic dust and fumes. Silicosis and related diseases are to be included. Specific projects for codes deal with rock drilling and granite cutting in addition to abrasive cleaning, spray coating and chromium plating.

The association says that a thoroughly bad situation has developed in the courts in respect to such diseases. Twelve states have extended workmen's compensation to cover industrial diseases, and as a result industries as well as insurance organizations feel that research into causes and prevention and the formulation of standards of practice for prevention are important.

California Law Aimed At Selling Below Cost

OVERHEAD EXPENSE DEFINED

A law was recently passed in the State of California to ban "loss-leader" selling. This law in many ways resembles the Codes under which industry formerly operated. The fundamentals of this new law are enumerated below:

1. Selling below cost is prohibited.
2. Cost is defined as invoice or replacement cost, whichever is lower; in the case of the distributor or in the case of the manufacturer, the costs of the raw material plus all overhead expense.
3. Overhead expense must include all of the following: Labor, including salaries of executives and officers; rent; interest on borrowed capital; depreciation; selling cost; maintenance of equipment; delivery costs; credit losses; all types of licenses, taxes, insurance and advertising.
4. Provision is made that cost may be proven on the basis of a survey made by the trade. This puts the burden of proof upon a defendant.
5. Violation of the act shall be a misdemeanor.
6. Upon three violations, the Attorney General shall institute proceedings to secure forfeiture of the right to do business with this State.
7. Any person, law enforcement official or trade association may apply for injunctive relief.
8. Provisions are made for handling of "distressed merchandise," "close-outs," and sales made under orders of the Court; also for meeting legal prices of a competitor.

The most interesting provision deals with the definition of cost and the declaration against "loss-leader" selling. It is also worthwhile to note the "cost" of doing business has been arbitrarily placed at 6 per cent. for retailers —the Code figure.

Producer Gets 250,000 Ton Sand and Gravel Contract

According to reports the Victoria Gypsum Co., will begin the production of gypsum as soon as the crushing plant and equipment is installed at Little Narrows, Cape Breton, N. S. The construction of a warehouse to accommodate 200,000 tons of gypsum is also planned.

★ The Federal Portland Cement Co., Buffalo, N. Y., has just completed the installation of a Dixie Mogul hammermill.

★ The Minnesota Sand & Gravel Co. of Minneapolis, Minn., have added eleven Jaeger truck mixers to their equipment.

$32,544,000 Granted For Chicago Streets

WORK TO BEGIN IMMEDIATELY

Illinois officials of the Federal Works Progress administration began Aug. 29 to prepare specifications for 1,200,000 tons of asphaltic mixture to be used in the resurfacing and improvement of nearly 1,000 miles of streets in Chicago. It was announced Aug. 27 that President Roosevelt had approved the program calling for a direct federal grant of $32,544,000.

Ralph H. Burke, deputy administrator of WPA, said that the definite money allocations would be cleared through governmental machinery at Washington "in a few days" after which notices and specifications would be sent to prospective bidders.

Tentative estimates on the asphaltic material call for a price of $6 a ton or a total cost of $7,200,000. In addition the street program will require a million barrels of cement and 800,000 yards of crushed stone for which no cost estimate is available.

Purchases will be made by local officials of the United States treasury in connection with WPA, Mr. Burke said. For purposes of better supervision and accounting the program has been divided into 170 projects upon which 38,000 men, drawn from the relief rolls, will be working when the program is at its peak.

New York Plant Installs Bag-Type Dust-Collector

★ Crampton Bros., Inc., have recently installed a large Parsons oval bag dust arrestor for eliminating dust conditions at their drier, weighing hoppers, etc., at their plant at Great Neck, L. I., N. Y.

New York Cement Plant Achieves 1,000-Day Record

The employees and officials at the plant of the Lone Star Cement Co. New York, Inc. of Hudson, N. Y., held a picnic August 17, in celebration of their completing a second year without a lost-time accident and also their admission into the 1,000-day safety club of the cement plants of North America. On July 1, the plant had completed 1,000 consecutive days without a lost-time accident.

Bids Opened for First Grand Coulee Cement

Bids for the first 4,220,000 bbl. of cement to be used in the construction of Grand Coulee Dam in Washington were opened August 20 at Denver, Colo. At the same time it was reported that pouring of concrete is expected to begin in October with the delivery of the first shipment of cement. The amount bid is said to be about half the amount of cement that will be required to complete the dam and its appurtenances. Meanwhile preparations for mixing and placing the concrete at Coulee Dam are progressing rapidly. The central-mixing operations and the sand and gravel plant, said to be the largest in existence, are ready to operate.

Bids were received from all of the cement plants operating in the states of Washington and Oregon. These bids range from $1.38 to $1.53 per bbl. f.o.b. mill. A bid was also submitted by the Pacific Portland Cement Co., San Francisco, Cal. for $3.10 per bbl. at Odair, Wash.

New Equipment Added To Ohio Crushing Plant

★ The crushed stone plant of C. E. Duff, P. O. Box 54, Lakeview, O., was completely rebuilt earlier in the year and Gates & Austin crushers, Niagara screens, and Diesel engines were installed.

Survey Reveals Growing Use of Oil on Highways

Due to increased construction of secondary and farm-to-market roads, financed largely by Federal funds, sales of road oil have increased more than one-fifth, according to statistical and economic surveys of the Petroleum Economics Division of the United States Department of Mines, Department of the Interior. Sales by petroleum refineries in the United States increased from 6,238,893 barrels in 1933, valued at $6,289,119, to 7,702,753 barrels in 1934, valued at $10,741,998. Gains were general, except in the Appalachian district but were greatest in the Rocky Mountain district, the Oklahoma - Kansas - Missouri district, the California district and the Indiana-Illinois-Kentucky district.

Indiana Gravel Producer Adds Crushing Equipment

★ Irving Bros. Gravel Co. of Marion, Ind., have added an Austin-Western 30-in. by 18-in. roller-bearing roll crusher to the equipment of their plant at Marion, Ind.

The plant of the Alpha Portland Cement Co., at Cementon, N. Y., resumed operations August 15, with an approximate working force of 150 men.

★ The Golden Sand and Gravel Co., of Red Bay, Ala., has installed a new agitator on its dredge.

★ The Jamestown Macadam Co., Inc., Buffalo, N. Y., has completed the construction of a new aggregate-bituminizing plant at Dunkirk, N. Y.

Taking Steps to Hold Trade Practice Meetings

100 INDUSTRIES COÖPERATING

Preliminary steps looking to the negotiation of trade agreements or the holding of trade practice conferences under the sponsorship of the Federal Trade Commission have been taken by representatives of approximately 100 industries, according to an announcement by the Federal Trade Commission. In addition to the approximately 100 industries which have entered upon negotiations directly with the Federal Trade Commission, James L. O'Neill, Acting Administrator of the National Recovery Administration, has referred to the Commission for its attention upwards of 20 suggested trade agreements submitted to the NRA by as many industries and correspondence files of more than 50 other industries which have indicated to the NRA an interest in the negotiation of trade agreements.

In authorizing a trade practice conference, the Commission must first be satisfied that the holding of such a conference is desirable and to the best interest of the industry and the public. An application in the form of a petition or informal communication should contain the following information:

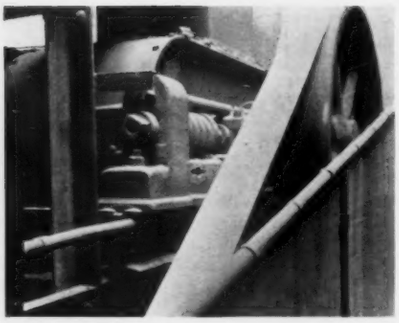
1. A brief description of the business for which the conference is intended. The number of units in the industry, and the number of employees engaged therein. The products manufactured or the commodities distributed. The annual volume of production, volume of sales, capitalization of the industry, or like items, should be approximated.

2. The authority of the person making the application should be shown. If made by a trade association executive, a resolution showing the action of the association should be submitted, together with a statement of the percentage of the entire industry represented by the association membership. This may be shown on the basis of the volume of business, or from the standpoint of the number in the industry, or both. If the application is filed by an unorganized group, the percentage of the entire industry represented by a group applying for the conference should be shown.

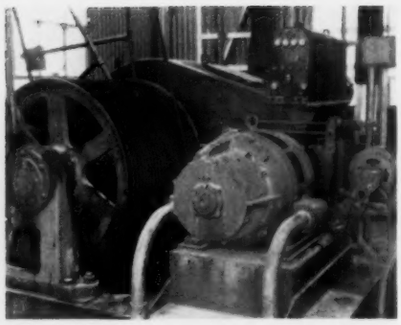
3. The application should state whether the conference is intended for all branches of the industry, or whether it is to be limited to a particular branch or branches thereof.

4. The application should further set forth any unfair methods of competition, trade abuses, or unethical practices existing in the industry, which it is intended to correct.

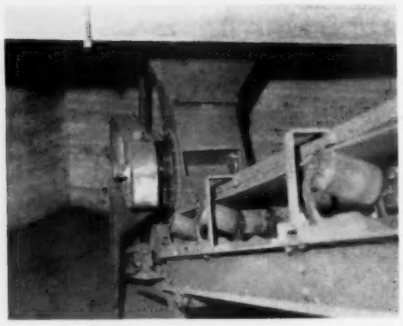
The Keokuk Sand Co., Keokuk, Ia., is reported to be remodeling its plant at Quincy, Ill.



Corrugated roll crusher which reduces the coke used in charging the vertical lime kiln.



Hoist which operates balanced skip used to charge vertical kiln. Speed reducer in background.



Star feeder which discharges coke from track hopper to belt conveyor feeding crusher.

Southern Alkali Corporation Completes First Year's Operation of New Plant

Oyster Shell and Limestone Used as Raw Materials in Rotary and Vertical Kilns

By W. E. TRAUFFER

ONE of the most important of a number of recent major industrial developments in the South was the erection of a new basic alkali plant at Corpus Christi, Texas, by the Southern Alkali Corp. Of the three new alkali plants recently started in the South, this one was the first to be completed. This project had been under consideration for a number of years but actual construction of the plant was not begun until about September, 1933. A year later the plant was in operation.

This is said to be the first alkali plant built at tide-water, giving it ideal transportation facilities for both raw materials and finished products. Other factors which influenced the choice of this site for the plant were the plentiful supply of low-cost natural gas from near fields and the availability of the principal raw materials required, salt, ammonia, coke, shell and limestone. The availability of raw

Aerial view of operations of Southern Alkali Corp. at Corpus Christi, Tex. Smoke is seen issuing from rotary lime kiln stack. Vertical kiln lime plant is directly below. At right a steamer is at the loading dock and in the left background is the oyster shell storage pile.

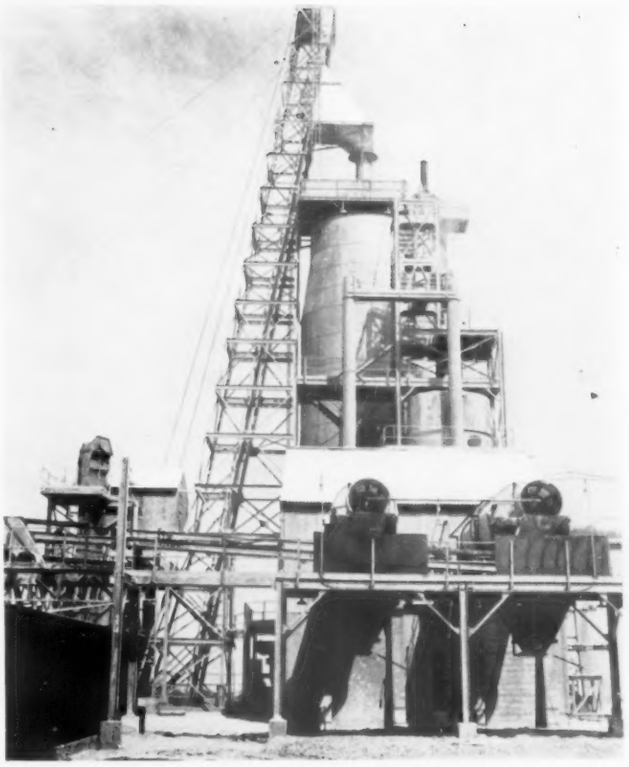
materials for the manufacture of other heavy chemicals and other products which require alkali or its derivatives was also considered. Of particular interest to lime producers is the fact that two methods of lime burning are used: rotary kilns for oyster shell and a vertical kiln for limestone and coke.

A brief description of the processes used follows. The limestone and coke are burned in the kiln from which carbon-dioxide (CO_2) gas is drawn. This carbonic acid gas is then forced through ammoniated salt brine and the resultant product is crude bicarbonate of soda. This bicarbonate, after being filtered out, is roasted into soda ash (sodium carbonate), either light or dense. The lime from the vertical kiln which produces the CO_2 gas, is used to recover by distillation the ammonia used in the process.

In the making of caustic soda (sodium hydroxide), soda ash is dissolved in water with burned lime and the reaction is called cauticization. The caustic liquor thus formed is settled and evaporated into solid material. The rotary kilns are used primarily to reburn the mud used in the causticizing process. Shell is burned only when it becomes necessary to add make-up lime to this mud.

Soda ash is used in almost all the chemical industries but principally in the manufacture of glass, washing soda and other cleansers, water purification, pulp and paper manufacture, textiles, etc. Caustic soda is used in the manufacture of soap, oil refining, rubber recovery, artificial silk or rayon. The products of this plant are shipped in paper and burlap bags, steel drums, and in bulk.

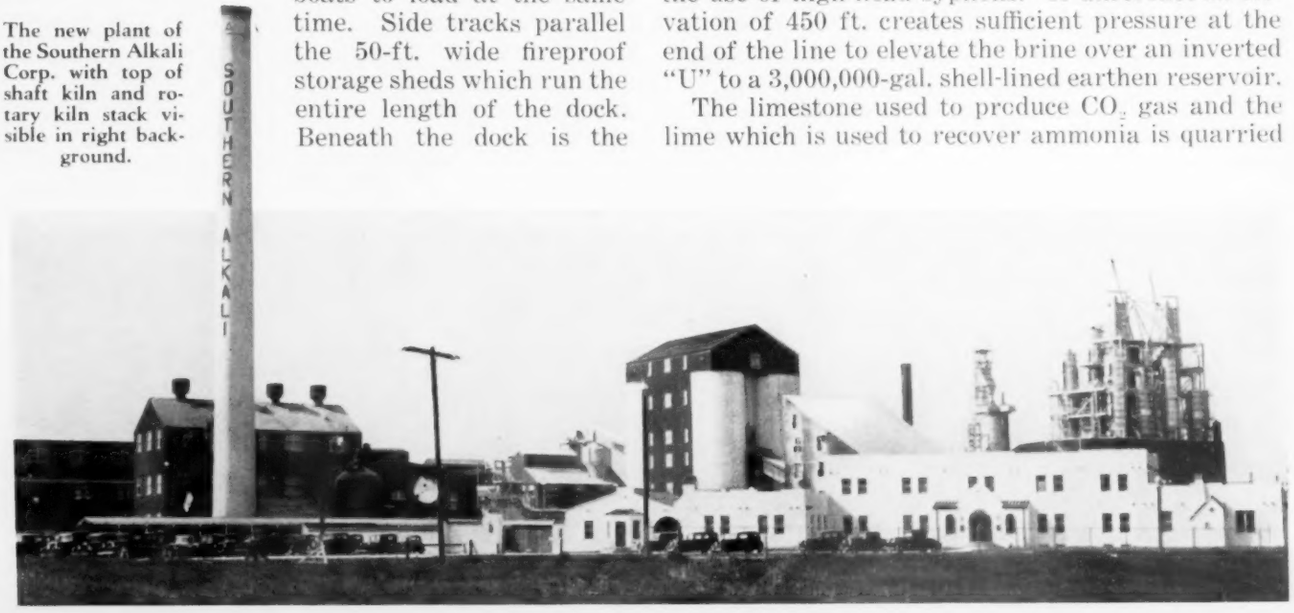
The plant is located about one and one-half miles west of the turning basin of the Port of Corpus Christi, necessitating the extension of the waterway to this point. This project, which is now completed, consists of a canal 7,500 ft. long, 150 ft. wide and 30 ft. deep. At the end of this canal and fronting the company's property a second turning basin, 1,600 by 800 ft., has been completed. The concrete deep-water dock is 100 ft. wide and 450 ft. long with a 250-ft. by 400-ft. slip on each side, allowing two boats to load at the same time. Side tracks parallel the 50-ft. wide fireproof storage sheds which run the entire length of the dock. Beneath the dock is the pumping station with centrifugal pumps which handle the 25,000,000 gal. per day of sea water required for cooling purposes in the plant.



The vertical lime kiln with skip used to charge with coke and limestone. The two rotary lime slakers are in foreground.

The salt brine which supplies the sodium radical for the making of sodium carbonate (soda ash) is obtained from the Palangana Dome in Duval County 6 miles north of Benavides, Texas, and 61 miles west of the plant. Brine wells tap an underground bed several hundred feet thick and 1,800 ft. below the surface. Fresh water dissolves the salt in the usual manner and the brine is pumped to a series of surge tanks. From these tanks the brine enters a 14-in. cast-iron pipe-line through which it flows the entire 61 miles to the plant by gravity without the use of high-head syphons. A difference in elevation of 450 ft. creates sufficient pressure at the end of the line to elevate the brine over an inverted "U" to a 3,000,000-gal. shell-lined earthen reservoir.

The limestone used to produce CO_2 gas and the lime which is used to recover ammonia is quarried



The new plant of the Southern Alkali Corp. with top of shaft kiln and rotary kiln stack visible in right background.

Another view of vertical kiln plant with lime elevator and storage tank at right.

near New Braunfels, Texas, and is shipped a distance of about 165 miles to the plant by rail. The stone is screened to 4 to 8-in. At the plant the stone is rehandled from the cars to a stock-pile or dumped directly to a 60-ton track hopper from which it is reclaimed by a 36-in. inclined pan conveyor on 50-ft. centers. Stock-piled material is rehandled to cars by a 2-cu.yd. Link-Belt gasoline locomotive crane. A 30-ton Plymouth gasoline locomotive hauls the cars.

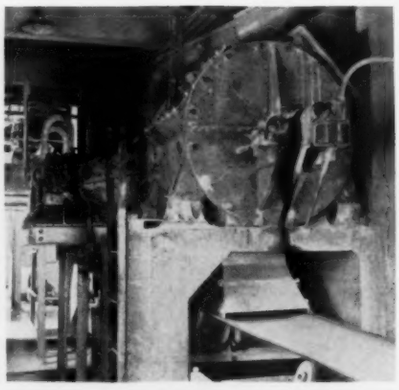
Coke is now obtained either from Birmingham, Ala., or from steel plants in the east, although petroleum coke may be used later. It is dumped from cars to another track hopper from which it is discharged by a star feeder to a 20-in. inclined belt-conveyor on 50-ft centers. The conveyor discharges the coke to a corrugated roll crusher and a bucket elevator feeds it to a 60-ton steel bin. A 24-in. by 12-ft. pan feeder discharges the coke to the stone conveyor to give about 8 per cent. by weight in the kiln charge. The feeder and conveyor are driven by the same motor in order to keep the charge constant and the relative proportions can be controlled at this point.

A balanced skip-hoist elevates the charge to the top of the kiln in a 100-cu.ft. car balanced by a counterweight bucket. The car is elevated 130 ft. at the rate of 150 ft. per minute by a hoist driven by a 25-hp. motor through a speed reducer. The motor is also equipped with a magnetic brake. The charge is discharged through a chute to a conical distributing device on top of the vertical kiln.

The kiln was designed by the engineering staff of the company from its experience at their other plants. It has 80 ft. of lined height of which the top 50-ft. section is 18 ft. in diameter. The lower 20-ft. section tapers to a diameter of 12 ft. 7 in. A 5-ft. wide circular wearing plate extends from the top of the lining to the top of the kiln. This plate takes the wear of the stone dropping into the kiln. Many different types of lining are being tried out, 8 at a time, using abrasion-resisting brick primarily in the preheating and cooling zones and heat-resisting brick in the burning zone. Kiln draft is furnished by two No. 30 blast fans.

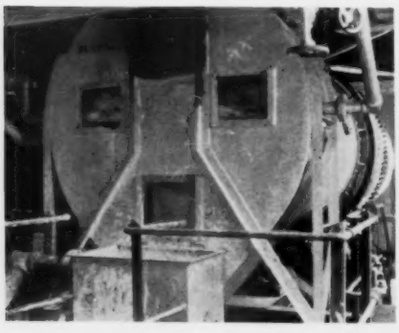
Coke is used as fuel because it gives off a much higher percentage of CO_2 than coal. The CO_2 gas is drawn out of the kiln by the suction side of compressors in the process building. This gas is used for carbonating the ammoniated brine to form sodium bicarbonate by the ammonia-soda process. This material is then heated to form sodium carbonate or soda ash.

An escargot or Archimedes screw gradually feeds the calcined lime evenly from all parts of the kiln area to a carrousel or revolving table feeder. This discharges the lime through a chute and sealed feeder to a belt-conveyor. This in turn feeds a chain bucket elevator which discharges the lime to a 30-ton capacity steel storage bin. Two pan feeders with variable-speed drives feed two large cylindrical rotary slakers. In these the lime is slaked in hot water to form a heavy suspension of lime or milk of lime.

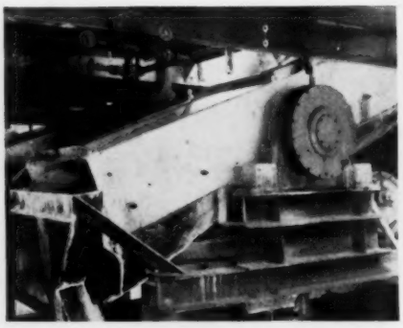


Sealed feeder which discharges lime from vertical kiln to belt conveyor.

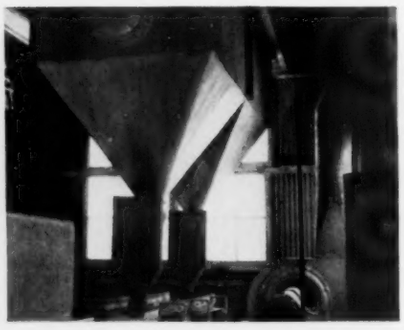
On the discharge end of each slaker is a perforated trommel. The coarse unburned stone (backrock or core) is retained on the trommel and returned by a series of two belt-conveyors to the kiln feed. The material through the trommel perforations is called sand and is collected in a hopper from which trucks haul it away for fill or



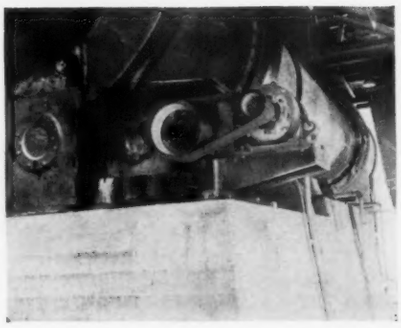
One of the two rotary slakers used in the vertical-kiln lime plant.



Two of the three vibrating screens which remove tailings from milk of lime.



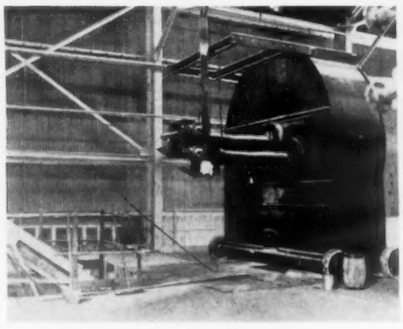
Two-unit dust collector which is connected to equipment in vertical kiln plant.



Left.—V-belt drive of one of the two rotary kilns used to burn oyster shell.

Below.—Arrangement for gas-firing on one of kilns. Bucket conveyor at left to caustic soda building.

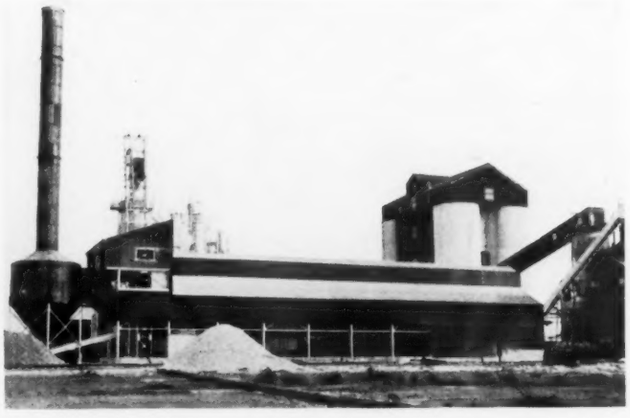
Right.—The two large rotary lime kilns viewed from firing or discharge end.



waste.

The milk of lime overflows at the feed end of the slakers and is passed over three single-deck 3-ft. by 8-ft. vibrating screens fitted with double mesh cloth. Tailings from the small-mesh sections are returned to the slaker by slurry pumps. Tailings from the large-mesh cloth are chuted to the lime elevator and back into the slakers. The milk of lime flows to agitator tanks from which it is pumped to the ammonia stills. A modern type 2-unit dust collector is connected to the vertical kiln discharge, and the lime belt-conveyor and elevator. A fan is connected to the collector.

The oyster shell used is dredged in Nueces Bay from extensive beds within a 5-mile radius of the plant. This is being done under a contract which delivers washed shell in barges at the company dock.



The rotary kiln lime plant with steel stack and centrifugal dust collector at left.

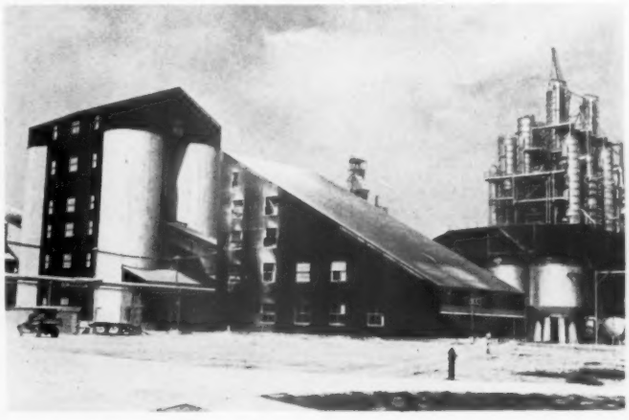
A gasoline driven crawler crane rehandles the shell from barges to a stock-pile. Trucks are loaded in a concrete tunnel under the stock-pile and then haul the shell to the rotary-kiln building where it is dumped into a track hopper.

A star feeder controls the discharge of the shell from the track hopper to a steel-inclosed chain-bucket elevator. A split chute feeds to screw feeders which discharge the shell through chutes to the two 9-ft. by 160-ft. rotary kilns. The kilns are natural gas fired, and are equipped with draft gages, recording pyrometers, etc. The quicklime is discharged to a drag-chain conveyor which in turn discharges to a concrete pit. An inclined bucket conveyor picks up the lime and carries it to the caustic soda building.

Ordinarily these kilns are used to reburn the mud which is a result of the causticizing process and which is pumped to a storage tank at the feed end of the kiln building. A filter wheel feeds the mud to the same screw feeders which measure shell to the kilns. A centrifugal dust collector settles the dust from the kiln gases and an inclined screw conveyor feeds this dust to the mud storage tank.

When the mud in the cycle is reduced to a point where it interferes with continuous operation the kilns are switched over to shell until sufficient make-up lime has been added to the system.

The plant was designed by the engineering department of the company and built by the H. K. Ferguson Co. It is laid out so as to minimize inter-unit material and equipment-handling costs while permitting future expansion without interrupting production and without affecting the basic production scheme. The various buildings form a hollow square capable of being enlarged several hundred feet in all directions. Capacity can be quadrupled with only a few slight changes to the equipment in the existing buildings. Wherever possible cast iron and stainless steel were used in the construction as common iron or steel is attacked and destroyed by the fumes. Buildings are of steel covered with aluminum paint and sides and roofs are of the latest type of protected metal. The brick and stucco office and laboratory building is of Spanish architecture.



Some of the storage and process buildings at the new plant of the Southern Alkali Corp.

The plant machine shop is one of the largest and most modern in the Southwest and a power plant is also maintained. The latter has a 220-ft. concrete smokestack which was erected by the Rust Engineering Co. Babcock & Wilcox Sterling gas-fired boilers furnish steam at 450-lb. pressure. Power is supplied at 2300 v. by two Westinghouse 5,000-kw. turbine generators. Every plant department has a substation for reduction to 440 v. Fresh water for the process and boilers as well as for cooling purposes in certain operations is obtained from the municipal pumping station and a 1,000,000-gal. reservoir at the plant site is kept in reserve. Sea water is used for primary cooling purposes. The machine shop is equipped to take care of all major and minor repairs. Equipment includes a general line of large capacity machine tools, electric and gas welding and cutting equipment. There are also boiler and sheet steel repair shops and a large storage warehouse.

The 30-ton gasoline locomotive and the 2-cu.yd. gasoline locomotive crane unloading limestone from car to stockpile.

The Southern Alkali Corp. is a jointly-owned subsidiary of the Pittsburgh Plate Glass Co. and the American Cyanamid Co. Since its formation the company has formed several subsidiaries: the Southern Minerals Corp., which owns and produces the minerals necessary for the operation of the plant; and the Southern Pipe Line Corp., which owns the pipe-lines and transports the minerals. The Southern Chemical Corp., also a subsidiary, will build a plant on the property in the near future to produce inorganic chemicals utilizing alkalies.

H. A. Galt, vice-president of the Pittsburgh Plate Glass Co., is president of the Southern Alkali Corp. Its vice-presidents include W. B. Bell and H. L. Derby, president and vice-president, respectively, of the American Cyanamid Co. and H. S. Wherett and Clarence M. Brown, president and chairman of the board, respectively, of the Pittsburgh Plate Glass Co. F. W. Currier is treasurer; O. N. Stevens is operating vice-president, residing at Corpus Christi.

Mineral Production in 1934

The mineral production of the United States in 1934—including metals, nonmetals, and fuels—was valued at $3,350,000,000, an increase of 31 per cent. from $2,555,100,000 in 1933, according to an advance summary published by the U. S. Bureau of Mines. This advance in total value reflected not only increased output but also higher unit prices which resulted in part from provisions of codes of fair competition under which virtually all branches of the mineral industry were operating to some extent during 1934. Production and prices of practically all major mineral commodities increased in 1934.

Seventy-five chapters giving complete production statistics of all mineral commodities are included in Minerals Yearbook 1935. This volume of approximately 1200 pages in blue cloth binding, can be supplied about September 30 at a price of $2.00 by the Superintendent of Documents, Government Printing Office, Washington, D. C., to whom remittance should be made. Past editions of the Minerals Yearbook have been exhausted promptly upon publication, and it is announced that requests for the 1935 volume will be filled in the order in which they are received.

Gypsum Production in 1934

A 23 per cent. upturn in general construction activity in 1934 was reflected in a 15 per cent. increase in gypsum production, in spite of the continued slowness in residential building, according to the U. S Bureau of Mines.

Crude gypsum produced in the United States in 1934 totaled 1,536,170 short tons, compared with 1,335,192 tons in 1933, the worst year since 1905, and 5,678,302 tons in 1925, the record year. Imports during 1934, largely from Canada, amounted to 360,186 tons, valued at $371,082, only slightly greater than in 1933. Sales of gypsum products in the United States manufactured from gypsum of both domestic and foreign origin amounted in 1934 to 1,140,590 short tons valued at $16,184,459, compared with 1,060,471 tons valued at $14,555,112 in 1933. Of the 1934 sales 1,074,017 tons valued at $15,510,835, or well over 90 per cent. were sold or used for building purposes.

Increases in output of gypsum were reported in every State except California which showed only a small decline. The four leading States together accounted for nearly two-thirds of the total output: New York produced 391,408 tons (363,745 tons in 1933); Michigan, 281,033 tons (211,392 tons in 1933); Iowa, 180,271 tons (172,555 tons in 1933); and Texas 138,326 tons (112,106 tons in 1933).

Talc and Soapstone in 1934

According to an advance summary published by the U. S. Bureau of Mines the talc and ground soapstone industry in 1934 reversed the upward trend which began in 1933. Total shipments by 32 producers in 11 States were 138,905 short tons, valued at $1,450,685, or an average value per ton of $10.44. The figures showed decreases of 16 per cent. in both quantity and value, compared with 1933. New York was, as usual, the leader in both quantity and value of output, although shipments from this State were 30 per cent. in quantity and value below those reported for 1933. Seven new shippers of talc were reported to the Bureau of Mines in 1934—3 in California, 1 in Michigan, 1 in North Carolina, and 2 in Washington.

Main conveyor from aggregate hopper to mixing plant.

Feeder discharging aggregates to main conveyor.

Looking down main conveyor at radial aggregate hopper.

New Concrete-Batching Plant Erected on Original Mixing-Plant Frame

Utilizes a Multi-Compartment Hopper Placed at Ground-Level

ON West Commerce St. near Trinity River in Dallas, Tex., the Dallas Concrete Co. operates a concrete-batching plant that has an interesting history. The concrete foundation and much of the concrete superstructure of this plant were erected in 1930 by the Dallas Transportation Co., which at that time operated another plant in Dallas. Due to depressed business conditions construction of the plant was discontinued until early in 1933. The Dallas Concrete Co. took over this plant in March, 1933, shortly after it was completed, in addition to the older plant at Junius and Dundee Sts. Most of the product of these plants is used for local building and sewer construction.

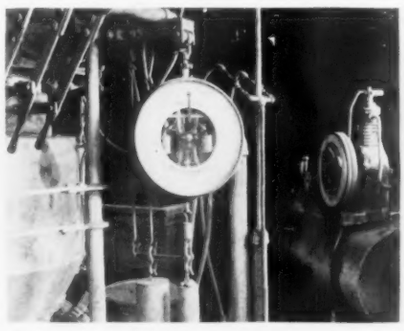
Sand and gravel are received by trucks from plants near Dallas. The trucks discharge into a ground-level concrete field hopper having six compartments of 100-ton capacity each. Four sizes of gravel and two sizes of sand are stored in it. The material is discharged through gates to a Barber-Greene vibratory feeder which carries it to the main Barber-Greene belt-conveyor. This conveyor operates on 300-ft. centers and discharges through a rotary spout to storage. This spout is controlled through cables by a hand-wheel from the point at which the conveyor emerges from the ground-hopper tunnel. The aggregates-storage system consists of a Johnson steel Octo-Bin with four 50-ton capacity compartments. The belt-conveyor is driven by a 60-hp. electric motor through a silent-chain drive and the feeder is chain-driven from the tail pulley of the conveyor.

Cement is received in bulk in box-cars and is taken in buggies to a hopper which feeds a Link-Belt chain-bucket elevator that is steel-inclosed and operates on 80-ft. centers. The cement is discharged through a selective split chute to either of two bin compartments having a capacity of 300 bbl. each. Usually one bin is used for standard Portland and the other for quick-setting cement. The elevator is gear-driven by a 20-hp. electric motor.

Aggregates are batched in a Johnson weigh-batcher equipped with beam scales and an over-and-under indicator of the same make. A tank-mounted Curtis air-compressor supplies air to keep the cement from arching in the cement bin. The cement is batched in another Johnson batcher equipped with a Toledo dial scale and a Foundry Supplies Mfg. Co. electric vibrator to insure complete discharge. Water from the city mains is measured in a tank fitted with a float indicator calibrated to

(Continued on page 36)

Truck discharging load into compartment of ground hopper.



Weigh-batcher, scale and compressor on batching floor.

One of the mixer trucks being loaded under the plant.

Left: One of the country's many paper mills dependent upon lime. *Below:* The sulphur industry uses large quantities of lime.

Wanted—A "New Deal" for Lime Consumers

By SIDNEY P. ARMSBY

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IN this article the author discusses the ways in which lime manufacturers, by coöperating with present and prospective customers, can solve some of the many problems that stand in the way of an expansion of the market for chemical lime.

●

CONSUMERS of chemical lime are clamoring for a "new deal." They are voicing a demand for a new type of service from the manufacturers of lime, based upon sound economic principles, and dedicated to the advancement of modern industry. And, in so doing, they are offering to the lime industry a wonderful opportunity for a constructive and profitable participation in a highly desirable development. Briefly, their demand is for a type of technical and informational service by lime producers that will adequately meet the technical requirements of lime consumers. There is nothing of a radical or revolutionary nature involved. In fact, it is an entirely logical development, based on a number of factors that have been well known to chemists and engineers for a long time. Its importance to lime producers lies not so much in the nature of the "new deal" that is being demanded as in the fact that good business judgment justifies the whole-hearted coöperation of the lime industry in realizing it.

Lime is used as a chemical reagent in literally hundreds of diverse manufacturing operations and processes, and it is the operators of these various industries, who are calling for the "new deal." They use lime for many reasons and for many purposes: Because it is the cheapest alkali available for specific reactions; because it produces certain desired results in precipitation, clarification, neutralizing, saponification, gas absorption, etc.; because it is efficient in promoting sedimentation, blending or some other physical action. Or they may use it for any one or more of a number of other specific chemical and physical effects that are known to every lime manufacturer. And it may be safely stated that a majority of the companies producing lime for the chemical trade have made sincere efforts to furnish such customers with the grades of lime best adapted to their individual requirements.

Yet every lime producer knows that, no matter how sincere his efforts, he has not always been able to maintain mutually satisfactory relations with all his chemical-lime customers. Disputes have arisen as to the efficiency of a certain grade of lime for some particular use. The accuracy of laboratory test results has been questioned. Complaints have been made that regular shipments did not conform to supposedly representative samples. The fairness of written contracts has been argued. Customers have switched to other grades of lime apparently without justification, and sometimes to their own disadvantage. Chemical specifications have caused endless discussion and argument. Still many good lime customers are not satisfied. And the lime producer wonders why this is so, and what he can do about it.

Citrus-fruit groves depend on the use of spray materials in the making of which lime is an essential raw material and chemical reagent.

The answer, *to both questions*, is comparatively simple. Lime consumers are dissatisfied either because they do not know exactly what kind of lime they do want, or because they do not know what they may logically expect of the lime they buy. The lime producer can remedy this situation by simply doing three things: First, helping the customer to determine his real lime requirements; second, furnishing him reliable *and complete* data as to the chemical and physical properties and the efficiency ratings of lime; and third, maintaining accurate standards of quality in the lime products sold. If the lime industry will do these three things, the lime-consuming industries will secure the service they are demanding, lime will receive the recognition it deserves as a high-grade chemical reagent, and lime producers will do a larger business, as well as one that is more pleasant and profitable.

Let us elaborate a bit, discussing in their logical order: (1) the problems involved; (2) the remedies indicated, and (3) the results that may be expected.

The Problems Involved.—One rather complicated problem has to do with the inefficient way in which many consumers make use of the chemical and physical properties of lime, sometimes without fully understanding what these properties are, and often with only a rather vague idea as to how they are utilized. Frequently lime is handled by rule-of-thumb methods, based on some supposedly efficient technique, which may perhaps serve adequately in the case of one particular lime but not with others. Or, perhaps, the mechanical equipment for slaking, mixing or applying lime is cumbersome, inadequate or expensive to operate. Again, the consumer may purchase a lime that does not possess the properties which are demanded by his process operations, in which case he is bound to be disappointed with the results obtained, simply because he "sent a boy to do a man's work."

Under all these conditions he is failing to get from lime the service he desires and expects, or the service to which he is *rightfully entitled*. He finds himself in about the same position as a carpenter who undertakes to do an expert job of cabinet making without the aid of a complete set of tools, or without knowing how to use them correctly. If the cabinet-making job is to be done correctly, the carpenter must acquire both the tools and the ability to use them. And the chemical engineer who requires lime as a reagent, or "tool," in his manufacturing operations realizes that he must understand both its characteristics and its correct utilization in order to make it effective for his use.

Wide-spread appreciation of this situation, together with an increasingly keen competition based on the development of greater efficiency in all manufacturing operations, is causing the lime-consuming industries to voice their demand for an economic "new deal" as regards the lime they use. They want primarily, not so much a better lime, but rather a better understanding of how to use it and more knowledge of what it can do for them. They expect, of course, that the right "tool" will be supplied them on demand for each particular job. But, above all, they are now looking to the lime industry for authentic data and reliable information, which will enable them to know which tool to call for and how to use it most efficiently.

Some Possible Solutions.—If lime manufacturers, both individually and collectively, will coöperate whole-heartedly with their customers in this matter, they will solve many of the problems now puzzling both interested parties; eliminate most of the existing uncertainties and misunderstandings about the value of lime as a chemical reagent; insure its efficient utilization by a host of industrial users; and, at the same time, they will profit very materially in a business way. A few specific illustrations will suffice to indicate some of the troublesome problems which may easily be solved by such concerted, coöperative effort.

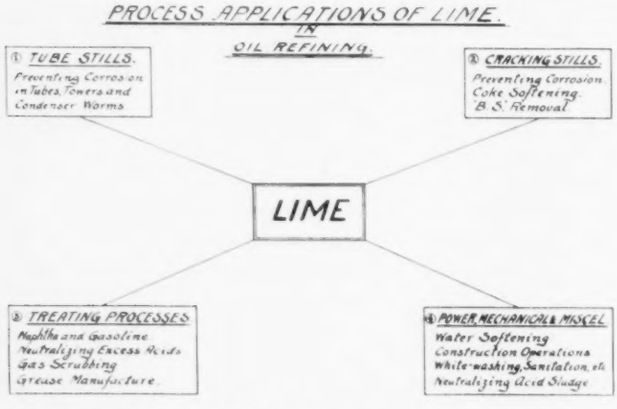
A certain large chemically-controlled plant, requiring a continuous supply of a standard strength milk-of-lime, tried several different brands of high-purity quicklime and secured apparently satisfactory results from all but one. This one was condemned as inefficient because it slaked very slowly and left too much "core" and "waste." Slaking tanks required cleaning out every day or so, and it was practically impossible to maintain the proper concentration in the milk-of-lime. The whole picture was changed, however, when the lime manufacturer demonstrated that this particular quicklime had been "drowned" by the use of too much water during the initial stages of slaking. By adding only enough water to just barely wet the lime, and then waiting about two minutes before adding the rest of the necessary water, it was found that the lime slaked out perfectly, left practically no waste, required less mechanical agitation, and produced more standard strength milk-of-lime per ton than any of the other limes under consideration. By understanding the unique slaking characteristics of this particular lime, *and by taking advantage of them*, the user was able to turn an apparent liability into a worth-while asset. And the lime

producer, by helping the consumer to obtain full value from the lime, helped him to increase the efficiency of his operations, and, by so doing, secured a really satisfied customer.

Another chemical manufacturer found, by repeated tests, that the efficiency of hydrated lime for his use apparently depended upon a certain combination of physical properties to a greater degree than upon chemical composition. He tried various brands of lime till he found one in which these physical characteristics predominated and immediately increased, by a substantial percentage, his yield of product per ton of lime used. It was soon found, however, that this particular lime contained a fraction of a per cent. of a certain impurity which gave rise to an objectionable side reaction. This, in turn, produced a small amount of an undesirable chemical compound which contaminated the finished product, causing subsequent spoilage (in storage) of more than the amount of the increased yield that had been secured. Therefore, the increased yield had to be sacrificed in favor of better keeping quality of the product.

In this case the lime producer, by assisting in the necessary research, and by gracefully withdrawing his product in favor of one proved more suitable, helped to solve an important operating problem and also promoted a better understanding of *how* and *why* certain effects are secured when lime is used as a chemical reagent. It is just as important to understand what lime will *not* do as it is to know what it will do.

Another problem that frequently interferes with satisfactory producer-consumer relations has to do with the methods employed for the evaluation of various lime products for different industrial applications. Many concerns purchase lime on the basis of specifications intended to insure the quality of the lime supplied them. All too frequently, however, such specifications are drawn up without proper consideration of the factors which affect the utility of the lime in actual use. Of what value is a total CaO content of 98 per cent. when a large part of it is combined (chemically or physically) with other ingredients in such a way as to be inert during a given process operation? Or why should a determination of water-soluble CaO measure the efficiency of a lime applied to some operation in which no water is used? Or why make fineness the essential requirement, if the reactive power of the lime is also governed by the rate at which it settles out of suspension? Or why penalize a lime because of certain inert impurities and ignore others that cause undesirable side reactions?


PROCESS APPLICATIONS OF LIME
IN
OIL REFINING
① TUBE STILLS.
Preventing Corrosion in Tubes, Towers and Condenser Worms
② CRACKING STILLS.
Preventing Corrosion. Coke Softening. 'B. S.' Removal
LIME
③ TREATING PROCESSES
Naphtha and Gasoline Neutralizing Excess Acids Gas Scrubbing Grease Manufacture
④ POWER, MECHANICAL & MISCEL
Water Softening Construction Operations White-washing, Sanitation, etc. Neutralizing Acid Sludge

Oil refining is typical of the lime-consuming industries which require a variety of functional effects from the lime they use.

None of these things are logical, and yet many of them are actually done simply because specifications are improperly drawn for specific lime requirements. Sometimes the buyer overlooks an important factor governing the functioning of the lime. At other times he chooses the wrong analytical method for determining a given property or ingredient. And, occasionally, he is merely groping in the dark for a better quality lime, without knowing that the specification he copied from some one else may not fit his requirements at all.

In any case, his failure to express his correct requirements works a hardship on both the interested parties. He fails to obtain the service he should get from lime, while the lime producer is either penalized for furnishing one material or prevented from supplying a more suitable product. Obviously, they both lose under such conditions. And both will continue to suffer until something is done to remedy the situation.

Here, again, the problem can be solved by coöperative effort. A careful study should be made of the manufacturing process involved, in order to determine accurately just what functions the lime performs and just how its efficiency is governed by each of its chemical and physical properties. If fineness of division is the most important governing factor, the specification should so recognize it, assigning relatively less weight to variations in purity when calculating values. If some impurities are definitely harmful, while others are inert, and still others are found to exert some beneficial physical effect (*e.g.* in promoting coagulation), then each type of impurity should be properly classified when determining the efficiency rating of the lime.

Very frequently it will be found that a number of opposing factors tend to off-set each other—the harmful effect of some impurity or some specific physical property being overshadowed by the beneficial effect of some other variable. Thus, the *net functional effect* of several combined variables in the lime may be either desirable, undesirable or of no importance, depending upon the individual effect of each variable and the relative percentage of each one present. In studying the problem, all such variables should be determined individually and their effects measured (both separately and collectively) by suitable chemical and physical analyses. Then two possibilities present themselves, as follows:

First, two or more variables may be properly combined for convenience in writing specifications and in making routine tests. For example, standard methods for determining "available lime" may be modified so they will automatically take into account the effects of such variables as fineness and rate of settling, without requiring separate determinations of these properties.

Second, it may be found that some permissible change in manipulation of the process under study will make it possible to obtain greater efficiency by either overcoming or taking advantage of some peculiar property of a given type of lime. For example, assume that a certain lime is entirely satisfactory as regards chemical composition, but is not fully effective because it settles out of suspension too rapidly in a specific type of reaction chamber. By merely adding the equipment necessary to produce sufficient extra agitation, it will be possible to prevent it from settling, thereby realizing its full chemical effect.

In either case—whether specifications and testing methods are simplified, or whether more efficient utilization of lime is achieved—several important benefits will have been realized by both the lime producer and his customer. The user will understand the properties of the lime and know how to apply them most effectively to his operations. Both he and the lime producer will understand what the real lime requirements are. And, best of all, the proper "yard-stick" will have been developed for measuring the unit value of all lime purchased by making both purchase specifications and testing methods conform as closely as possible to the actual operating procedure employed in using the lime.

Surely, such development of more accurate "yard-sticks" for lime is a "new deal" worth having! Especially when it is accompanied by increased production efficiency, and when it promotes the best interests of both the producers and the consumers of chemical lime.

Another problem that puzzles the prospective chemical-lime consumer is the question of when to use lime in preference to other materials offered as substitutes. Here again, the lime producer is vitally interested because of the possibility of losing a market that should rightfully be his. And, as in the cases previously cited, coöperative effort will solve the problem.

When lime is displaced by some more costly or less efficient reagent, it is either because the customer has been made the victim of "high-pressure" sales methods, or because he honestly does not know what he could do with lime. Whatever the reason, if he can be furnished with complete information regarding the actual value of lime, as applied to his operations, he will at least be able to decide the problem on its merits and to choose the most economical reagent without having to take the, possibly prejudiced, opinion of any other interested party. And, regardless of what the ultimate results may be, you may be sure that he will appreciate the source of his information. The manufacturing chemical engineer to-day wants all such information that is available, and is anxious to coöperate with the manufacturer who will help him to obtain it.

Coöperative study of the reactions and processes involved, as previously outlined, will develop the knowledge necessary to determine the relative efficiency of lime as compared to other possible materials and, in a great many cases, will restore to the lime-industry market outlets that have closed to it by reason of an incomplete understanding of the properties of lime and their correct utilization by the process industries.

When this final objective is attained, lime will be properly classified as a chemical reagent, lime sales will be consummated on the basis of true merit and service rendered, lime consumers will know what to expect of lime and how to obtain full value from it, and the highly-desirable "new deal" will be an accomplished fact.

How Results Can Be Secured.—The lime industry can, and very properly should, make the first move toward inaugurating the "new deal" I have been discussing. It already has, in the National Lime Assn., the nucleus around which can be built an efficiently functioning research and promotional organization, charged with the responsibility of developing and disseminating the fundamental technical information that is so essential to the advancement and growth of the industry. Such an organization, competently staffed, adequately supported and consistently maintained, can and will do the following things:

(1) Establish a better spirit of friendly coöperation between lime producers themselves and with the consumers of lime, with the fullest possible freedom in the exchange of ideas between producers and consumers.

(2) Assemble and correlate the existing fragmentary technical data on lime as an industrial reagent.

(3) Undertake laboratory and field research to fill the gaps in our present knowledge of lime and its properties, by making critical and detailed studies of processes in which lime is used, the chemical reactions involved, the physical and mechanical conditions affecting such reactions, and the degree of effect introduced by each variable.

(4) Classify and tabulate all the data so secured, in such a way that the information may be applied to the practical solution of the consumer's production problems and to the maintenance of adequate, simplified purchase specifications and testing methods.

(5) Establish proper standards of quality for lime products—based upon the *functioning* of the lime rather than on mere composition—and provide the means whereby suitable process control by lime manufacturers will insure the maintenance of such quality standards.

(6) Reduce the cost of doing business, by enabling the lime producer to know the markets for which his products are indicated and the ones for which they are unsuited.

(7) Develop new markets for lime and revive others which have been slipping away because of the more aggressive promotional activities of the manufacturers of competing materials.

(8) Develop uses for by-products and economical methods for capitalizing them.

(9) Finally, it will institute and continuously

(Continued on page 34)

Kentucky Sand Rock Asphalt Producer Announces New Processed Material

Follows Completion of Program of Mine Development and Plant Improvement

By W. E. TRAUFFER

The Kentucky Rock Asphalt Co., Inc., Louisville, Ky., said to be the world's largest producer of rock asphalt, is now producing processed Kyrock to meet the demand for a lower cost road material. The required amount of bitumen can be added to this material by the company before shipment or by the user. The unprocessed lean rock takes a lower freight rate than either the processed or natural Kyrock. The chief saving in the cost of the lean rock lies in the utilization of waste material which has been blasted and laid aside in over 16 years of production of natural Kyrock. The lean rock is also easier to crush and screen in the plant. In the production of natural Kyrock no rock containing less than 6 per cent. natural bitumen is used. For the processed Kyrock rock with 3 to 6 per cent. bitumen content is used.

Plant of Kentucky Rock Asphalt Co. at Kyrock, Ky. Barge-loading conveyor is at lower left and primary crusher building is at extreme right.

The processed Kyrock has the same pure sharp silica sand aggregate as natural Kyrock and has about 75 per cent. of its natural asphalt content coating the individual sand grains. This is said to give the new product the same stability and wearing quality as the natural Kyrock and bonding and non-rot qualities closely approaching it. The approximate 25 per cent. of asphalt added closely approximates the natural Kyrock bitumen and is so processed as to develop a complete amalgamation of the two. This processing can be done in any plant now producing hot or cold materials. Like the natural Kyrock this material can be laid hot or cold.

The new electric vibrating screen which precedes hammermill in flow.

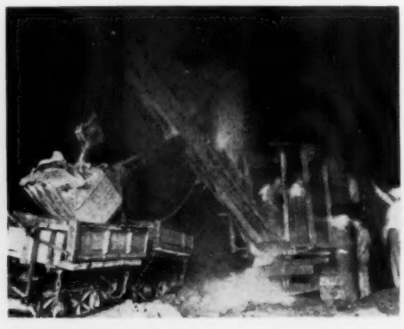
Processed sandstone rock asphalt is not a new thing as in the early days of this industry in Kentucky much of the material was marketed in this form. Sections of some of the old pavements laid with this material are said to show no appreciable abrasive wear or disintegration where placed on an adequate base. The new product, because of more accurate control, is expected to exceed the records of these old pavements.

The Kentucky Rock Asphalt Co., Inc., opened up its present operations at Kyrock, Ky., in 1918. Its holdings comprise about 45,000 acres located in three counties on a peninsula between the Nolin and Green rivers about 35 miles northeast of Bowling Green, Ky. The entire area has been prospected and plotted for future working.

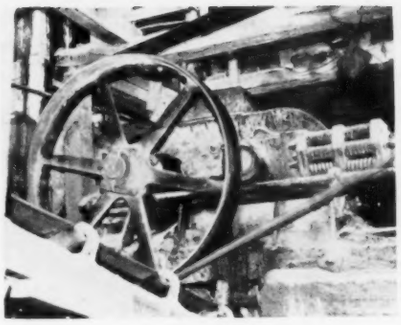
A detailed description of the company's operations was published in the June 19, 1929, issue of

View showing some of the six mine openings. Note depth of over-burden.

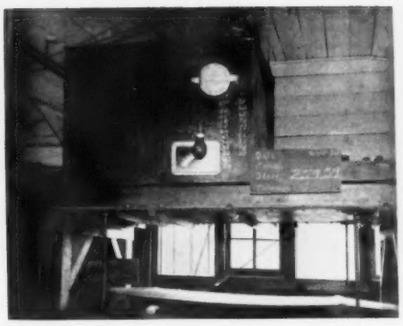
Loading drill holes in preparation for a blast in one of the six tunnels.



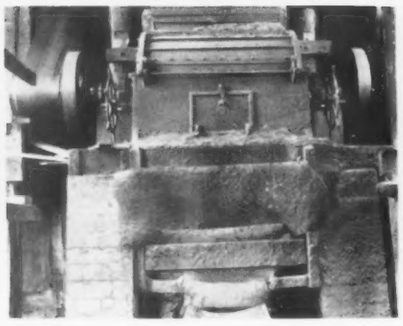
Steam shovel loading rock asphalt to cars in one of the mine tunnels.



One of the two 24-in. by 54-in. roll crushers used in reducing the rock.



The weighing device which weighs material on belt conveyor loading barges.



The hammermill which performs final reduction of material before shipment.

PIT AND QUARRY. In this article the open-pit quarrying methods then in use were completely described. Sandstone overburden averaging from 50 to 90 ft. in thickness was drilled and blasted by ordinary bank methods and hauled away to waste. The commercial rock was then also drilled and blasted and handpicked to skips for loading to cars. After the rock suitable for natural Kyrock was removed the balance was hauled to waste. This waste is the lean sandstone rock asphalt now being marketed. Similar methods are now in use at several of the company's quarries except that the lean rock is no longer wasted.

The Indian Creek quarry was opened in 1928 and is regarded as one of the richest known deposits. Ordinary quarrying methods were first used but in 1933 because of excessively heavy overburden mining of this material was begun. Six 40-ft. wide tunnels have been opened with 16-ft. pillars 50 ft. long. Actually these pillars are formed by staggered openings between the tunnels just wide enough for the passage of a shovel. Tunnels vary in height from 16 ft. to 24 ft. depending on the strata.

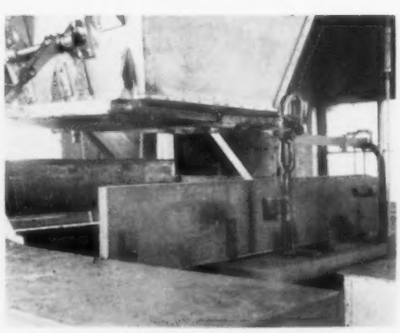
In developing these tunnels heading holes are first drilled 6 ft. down from the top and about 10 ft. into the deposit. After this stone is removed the lower stone is broken by bench shooting. Ingersoll-Rand S49 wet drifter drills with 1-in. hollow drill steel are used and shooting is done with 50 per cent. gelatin in the headings and 30 per cent. in the benches. Shafts to the surface ventilate the tunnels and a centrifugal pump is used for drainage.

Material is loaded out from two tunnels at a time. Two Erie Type B ¾-cu.yd. steam shovels load to cars which are hauled 3½ miles to the plant by steam locomotives. Two Model 60 Marion 2½-cu. yd. steam shovels are used to reclaim lean rock in this quarry.

Only a few minor improvements have been made to the plant in recent years. The rock asphalt is discharged from the cars direct to the Allis-Chalmers 48-in. by 60-in. primary jaw crusher. This reduces the rock to minus 8-in. size and discharges to a 30-in. downhill belt-conveyor operating on 550-ft. centers which in turn discharges to storage bins with a total capacity of 600 tons. A tripper loads the bin compartments alternately and a further rough blending is obtained when the material is reclaimed from the compartments through lever-controlled gates. Another 30-in. belt conveyor, on 60-ft. centers, feeds the blended rock asphalt to a Good Roads 24-in. by 52-in. jaw crusher which reduces the rock to 4 in. minus.

Clamshell derrick unloading rock asphalt.

A 20-ft. belt-conveyor feeds the rock to an Allis-Chalmers 24-in. by 54-in. Anaconda roll crusher with corrugated rolls. The product is chuted to a Tyler 400 4-ft. by 8-ft. single-deck electric vibrating screen with ¾-in. wire cloth. The oversize goes to a roll crusher similar to the first except that it has smooth rolls. This reduces to ¾-in. minus. The fines from the screen and the crusher product discharge to a belt-conveyor which feeds this material

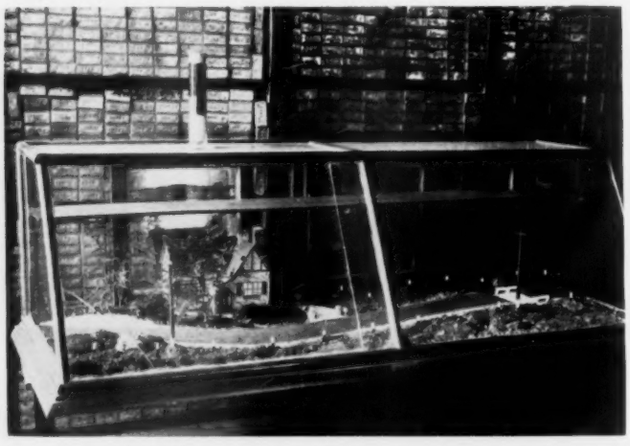


Batcher at mixing plant where bitumen is added for "processed" material.

Bucket on one of two cableways which can discharge to mixing plant or stockpiles.

Shovel loading to cars for shipment. Tail tower of one of cableways in background.

to four Allis-Chalmers 16-in. by 42-in. smooth roll crushers which reduce to about 95 per cent. through ¼-in. Another belt-conveyor feeds to a new Tyler 400 4-ft. by 8-ft. single-deck electric vibrating screen with ¼-in. wire cloth. The coarse consisting largely of caked material is fed to a new No. 5 Williams hammer-mill which reduces to 98 per cent. through No. 4 mesh. The fines through the screen with the product of the hammer-mill go by belt-conveyor over a Merrick Weightometer and to spouts for direct loading to barges. This conveyor is 30 in. wide and 225 ft. long. The plant has a rated capacity of 1,000 tons daily although as much as 1,500 tons have been produced.



Realistic model of rock asphalt highway in chemical and testing laboratory at Kyrock.

All material produced is shipped by barge to storage yards at Rockport on the Green River and Bowling Green on the Barren River. Completion of locks on these rivers during the past year allows navigation to these points the year round. Rail and truck shipments are made from these yards. The barges used have a capacity of 300 tons each and are towed by both Diesel and steam tugs.

As described in the previous article the barges are unloaded at Bowling Green by a derrick. Cars on a double incline feed a double aerial tramway of 300-ft. span. Stock-pile storage capacity with this system is about 175,000 tons. Material is loaded out for shipment by shovels.

When lean rock asphalt is being unloaded one of these cableways can feed to a mixing plant which was erected late in 1934 near the river terminal of the cableway. Usually, however, a locomotive crane rehandles to this plant from stock-piles. The material is discharged from a hopper to a weigh batcher designed and built by the company and equipped with Fairbanks scales. Another batcher also equipped with Fairbanks scales weighs the bitumen which raises the content of the lean rock from an average of 5 per cent. to 7.4 per cent. A 4,000-lb. capacity Warren pug mill creates an intimate mixture of these ingredients and discharges direct to cars or trucks for shipments. Bitumen is stored in a 15,000-gal. capacity underground tank from which it is pumped to a smaller tank in the plant.

The yard at Rockport and other features of the company's operations have not been changed since described in the previous article.

The main office of the Kentucky Rock Asphalt Co., Inc., is in the M. E. Taylor Bldg., Louisville, Ky. Officers are: D. D. Thomson, president; Rodman Wiley, sales manager; H. St. G. T. Carmichael, in charge of production; A. A. Hermes, secretary and treasurer. A. H. Hinkle, former chief engineer of the Indiana state highway department is research engineer.

New Deal (from page 31)

carry forward a campaign of soundly organized technical promotion work; educating the lime-consuming industries in the proper utilization of lime, and giving them exactly what they are asking for—the ability to employ lime understandingly, economically and efficiently to their own advantage.

Of course, no such program can be completed in any short space of time. The start has been delayed too long, and there is a vast amount of work to be done. But it can be done if given the support of the industry which stands in line to profit most substantially by it. Certainly it is a "new deal" that is entirely free of politics, and deserving of the vote of every lime manufacturer. Why not get behind it, and make it a reality?

Fuller's Earth in 1934

Production of fuller's earth in 1934 amounted to 220,264 short tons valued at $2,085,081 compared with 224,152 short tons valued at $2,080,640 in 1933, according to an advance summary published by the U. S. Bureau of Mines. For the fourth consecutive year, the production of fuller's earth in the United States declined in 1934. While the decline was slight, amounting to only 1.7 per cent. when compared with the preceding year, it was notable because it continued a downward trend in the output of a mineral whose production had shown a rapid and almost uninterrupted increase over a period of 35 years. The decrease in tonnage was accompanied by an increase of 9 cents per ton in the average price at which the material was sold, and the net result was a slight increase in value.

Sixteen plants in 8 States operated by 14 companies reported production of fuller's earth in 1934. Most of the production came, as in previous years, from deposits in Georgia and Florida; in fact, these two States accounted for 67 per cent. of the total output of the entire country.

Mica Production in 1934

According to the U. S. Bureau of Mines the total quantity of unmanufactured sheet and scrap mica sold by producers in the United States in 1934 was 8,011 short tons valued at $190,059, compared with 8,933 short tons valued at $151,338 in 1933. The total consisted of 583,528 pounds of unmanufactured sheet valued at $90,268 and 7,719 short tons of scrap valued at $99,791.

Plant of Southern Rock Asphalt Co. near Dougherty, Okla.

View of quarry illustrates methods of drilling, loading and hauling.

Proportion Sand and Sandstone to Give Rock Asphalt Desired Content

Former All-Electric Operation Now Run by Diesel and Gasoline Engines

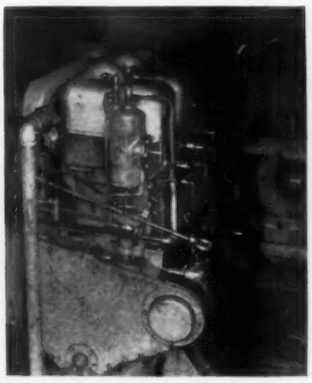
BEFORE the advent of cheap residue from the oil refineries which have sprung up throughout Oklahoma in recent years the production of rock asphalt for road-building was a flourishing industry in that state. It is estimated that over fifty asphalt mines and quarries were at one time operated in Oklahoma, but of that number only a few remain. One of these is the operation of the Southern Rock Asphalt Co. at Dougherty, Okla., about 8 mi. southwest of Sulphur. This plant has been kept efficient through the installation of modern equipment. The raw-material source is an unusual combination of asphaltic sandstone and asphalt sand. A capacity of about 85 tons per hr. is obtained.

The rock-asphalt quarry is about ¼ mi. from the plant in a deposit of sandstone having an asphalt content ranging from 3 to 4 per cent. This is supplemented by asphalt sand obtained from pits about 4 mi. from the plant. This sand has an asphalt content of from 10 to 12 per cent. The two materials are mixed at the plant to obtain the desired asphalt content in the finished product.

At the quarry the overburden of rock and dirt, varying from 2 to 20 ft. in depth, is removed and is used for track fill between the quarry and the plant. Blast holes are drilled for the major quarry shots by a Fort Worth drill, and Ingersoll-Rand Jackhamers drill for secondary shooting. Small side-dump cars are loaded by hand and allowed to roll downgrade to a concrete hopper at the plant. Mules haul the empty cars back to the quarry. Two Ingersoll-Rand compressors, one stationary and one portable, supply the air for drilling.

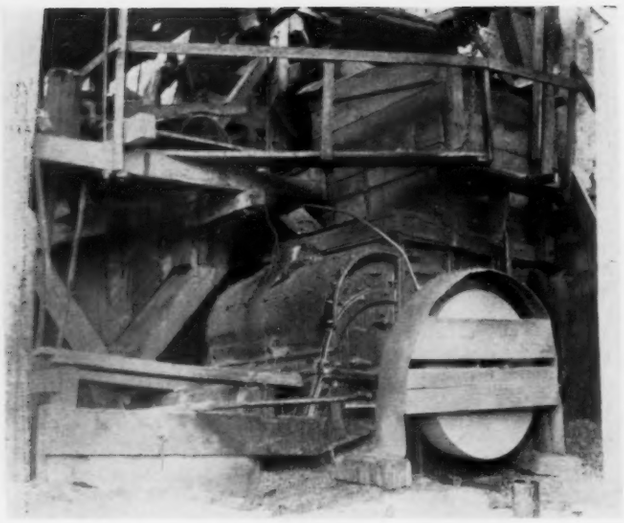
Sand is excavated at the pits by Northwest,

Truck-load of sand and car-load of rock asphalt being discharged to plant.



New 125-hp. Diesel engine driving part of equipment.

One of the two hammer-mills used in reducing the asphalt rock to the desired size.



New primary-crushing hammer-mill in the plant of the Southern Rock Asphalt Co. at Dougherty, Okla.

New central-batching plant of the Dallas Concrete Co. at Dallas, Tex. Aggregate hopper is in background.

Koehring and Insley gasoline shovels and is loaded into trucks, 35 of which are used to haul it to the plant. About 10 ft. of earth overburden must first be removed.

The sand and stone are dumped into the same concrete hopper at the plant. An apron feeder discharges the materials into a Williams W2 Jumbo hammer-mill which feeds a belt-conveyor. This discharges the material on a 5-ft. by 8-ft. Simplicity single-deck vibrating screen equipped with ¼-in. and ⅜-in. wire screen cloth. The coarse material retained on the screen drops into a second Williams hammer-mill. The product of this mill is taken by a short belt-conveyor to the main conveyor feeding the screen. The fine material passing the screen is chuted direct into railroad cars for shipment or into trucks for shipping or stock-piling. All the shipments are weighed on Fairbanks truck and railway scales. Stock-piled material is reclaimed by a Northwest gasoline crane having a 1½-cu.yd. clamshell bucket.

The plant was formerly entirely electrically driven but is now being changed to internal-combustion power. The secondary hammer-mill and the main conveyor are driven by a 125-hp. Atlas Imperial air-injection type full-Diesel engine. A 150-hp. Atlas Imperial engine of the same type drives the primary hammer-mill. Both these engines and the primary hammer-mill were installed late in 1934. Electric motors operate the screen and the stationary quarry compressor.

Concrete Plant (from page 27)

measure by volume or weight as desired.

The sand and gravel and cement are discharged simultaneously from their respective batchers through a spout into the mixer truck. Water is then discharged from the chute, cleaning the spout. The company owns 15 mixer trucks, 2 of 3-cu. yd. and 13 of 2½-cu. yd. capacity. Most of these are Jaeger mixers mounted on Liberty trucks. All these trucks are equipped with General heavy-duty tires.

In addition to the two plants in Dallas, the company also owns the Trux-Mix Co., at Longview, Tex., in the heart of a growing oil field. Late in 1933 this company erected near that city a central batching plant which specializes in concrete for oil-well derrick and pump foundations. The office of the Dallas Concrete Co. is at the new plant. The company's officers are: W. B. Palmer, president; H. L. Lacy, vice-president; Robert E. Wynne, treasurer and secretary; H. A. Glenn, general manager.

Feldspar Production in 1934

The output of crude feldspar in the United States in 1934 was 154,188 long tons, valued at $853,136, against 150,633 long tons, valued at $778,826, an increase of 2.4 per cent. in quantity and 9.5 per cent. in value, according to an advance summary issued by the U. S. Bureau of Mines.

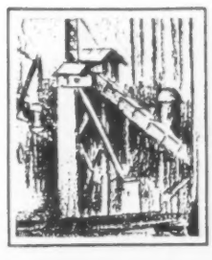
The increase in total production of feldspar in 1934 was due principally to expanded output in the smaller producing States as production declined in three of the four principal producing States. Output in North Carolina declined about 7 per cent.; Virginia, almost 10 per cent.; and New Hampshire, 2.5 per cent.; whereas production in Maine increased more than 30 per cent. South Dakota showed a gain of nearly 6,000 tons, the largest tonnage increase of any State, and by far the highest percentage gain.

Tonnage of domestic feldspar ground by merchant mills in 1934 showed a greater rate of increase over 1933 than the output of crude spar mined, indicating heavy withdrawals of stocks of crude accumulated at mills during 1933. Total sales of ground feldspar by merchant mills in 1934 amounted to 144,178 short tons, valued at $1,868,500, an increase of 8.4 per cent. in tonnage and 15.5 per cent. in value compared with 1933.

MEN OF THE INDUSTRY

J. A. RIGG

J. A. RIGG has been manager and treasurer of the Acme Limestone Co., Fort Spring, W. Va., for 20 years. He is a vice-president and director of the National Crushed Stone Assn., and for many years has been a strong supporter of its Bureau of Research and Engineering. The Acme Limestone Co. under his management has been outstanding in diversifying its products through careful experiment and research. Under the NRA he was vice-chairman and a member of both the Executive Committee of Region No. 4, and the W. Va. Aggregates District. At present he is on a committee of three endeavoring to form a state association to save to the mineral aggregates industries the benefits of the code.



Personal Mention

Martin H. Kidder has been appointed advertising and industrial relations director for the American Foundry Equipment Co., 555 Byrkit St., Mishawaka, Ind. He will supervise all advertising, direct mail, sales promotion, publicity and market exploitation on such products as electric unit heaters, dust collectors, etc.

G. L. Kirp, formerly chief chemist for the Kosmos Portland Cement Co., Kosmosdale, Ky., is now chemist for the Petoskey Portland Cement Co., Petoskey, Mich.

Harry E. Heath, who has had a long and varied experience in the automotive and allied industries, has been appointed general sales manager of the Amplex Division of the Chrysler Motors Corp. This division specializes in marine and industrial activities.

A. H. Ayers, chief engineer for Six Companies, Inc., at Boulder Dam since 1931, has been transferred to the Oakland, Calif., office as chief engineer and secretary to the executive committee of the company.

W. A. Meddick has been appointed to a position in the Sales Department of the Bartlett & Snow Co. of Cleveland, O.

J. G. Hoag, who has been identified with the Osgood interests for the past 15 years, has been appointed manager of the Philadelphia branch of the Osgood Co., located at 236 North 23rd St., Philadelphia, Pa.

Frank L. Gibbons, who has had extensive experience in the steel industry and who has been connected with the Timken Steel & Tube Co., Canton, O., since 1932, has been elected vice-president of the company in charge of sales.

Dr. Irving Langmuir, associate director of the General Electric Research Laboratory, was awarded the Holley Medal for 1934 on June 20, at the semi-annual meeting of the American Society of Mechanical Engineers at Cincinnati, O. More recently he has been elected to foreign membership in the Royal Society, one of the highest honors British scientists can bestow on an alien.

William C. Weber has been appointed assistant to the manager of the development department of the Dorr Co., New York, N. Y.

Arthur D. Camp has joined the staff of the Dorr Co. at New York. He was formerly with the Thomas and Hochwalt Laboratories, Dayton, O.

C. T. Melvin of the Gulf Fertilizer Co., Tampa, Fla., has been elected president of National Fertilizer Assn. The new vice-president is **W. T. Wright** of F. S. Royster Guano Co., Norfolk, Va., and **Charles J. Brand** has been re-elected executive sec.-tr.

F. C. Cheney, president of the Cheney Lime and Cement Co., of Birmingham, Ala., is recovering at his home in Allgood, Ala., from injuries recently suffered in an automobile accident.

Robert Wilson, assistant general manager of the Thew Shovel Co. and Universal Crane Co. is personally directing the activities of these firms from their New York offices at 500 Fifth Ave. **Stanley R. Shepard,** who has been with these companies for the past ten years, has been appointed up-state district manager in the state of New York. **Donald G. Savage,** who at one time represented these firms in the up-state district, is now sales manager of these two companies with offices at Lorain, Ohio.

B. J. Schneider, who was formerly connected with the Combustion Engineering Co., has been appointed district representative for Indiana and Kentucky, of the C. O. Bartlett & Snow Co. His office will be located at 909 Roosevelt Bldg., Indianapolis, Ind.

P. J. Potter, 2nd vice-president, was elected a director and vice-president of the Pangborn Corp., Hagerstown, Md. Mr. Potter has been with the corporation for 20 years. **Victor Stine,** who has held executive positions in the corporation for the past 23 years, has been elected second vice-president and promoted to sales manager.

Arvid Brandberg, chemical engineer of the Scandian Portland Cement Co., of Malmo, Sweden, recently visited the plant of the Ash Grove Lime & Portland Cement Co., at Louisville, Neb., from where he and Mrs. Brandberg went to Laramie, Wyo., to visit the plant of the Monolith Portland Midwest Co., and then to the Pacific coast to visit the important cement manufacturing plants there.

George Meyers, manager of the Ohio Rock Asphalt Co., at Dunn's Chapel, O., is recovering from serious injuries received in an automobile accident in which three men were killed.

Arthur E. Martin, chief clerk in the accounting department at the plant of the Universal Atlas Cement Co. in Hudson, N. Y., was awarded the silver service medal by Supt. **Richard A. Dittmer** for 25 years service with the company.

W. M. McConnell has joined the engineering dept. of The Patterson Foundry & Machine Co., East Liverpool, O., to take charge of the drafting room.

Obituary

Arthur F. Williams, 55, president of the Williams Patent Crusher & Pulverizer Co., manufacturer of machines for crushing and pulverizing stone, coal, feed and fertilizers, St. Louis, died there Aug. 21 after a lingering illness. Mr. Williams had been president for 12 years of the company which was founded in 1897 by his father, the late Milton F. Williams.

B. W. Traylor, 64, prominent crushing and mining engineer, and district manager of the Southern sales office of the Traylor Eng. & Mfg. Co., Allentown, Pa., died of a heart attack at Louisville, Ky., on August 14. Born in Texas, a member of one of the pioneer families of that state, Mr. Traylor brought to the Traylor Eng. & Mfg. Co., upon its incorporation, a wealth of experience as a designer, builder and operator of metallurgical plants, which was a valuable aid to the company which he served successively as superintendent, general manager, vice-president and district sales manager.

Aman Moore, president of the Acme Cement Co., Los Angeles, Cal., died July 27 in New York City while on a business trip.

Anthony Kucera, 27, died July 27, from injuries received at the quarry of the Great Lakes Dredge Co. in Lemont, Ill. Kucera was injured when 35 dynamite caps he was carrying exploded.

Angelo Dare, 24, was crushed to death by a rock slide July 30, at the quarry of the Albion Slate Co. of Pen Argyl, Pa.

Frank J. Brew, sales manager for the Waukesha Washed Sand & Gravel Co. of Milwaukee, Wis., died at his home August 7, from heart disease.

Coming Events

September 11, 1935, Albany, N. Y.—Annual midsummer meeting of the New York State Crushed Stone Assn., Schuyler Meadows Golf and Country Club, Loudonville, Albany, N. Y.

October 14-18, 1935, Louisville, Ky.—24th Annual Safety Congress, National Safety Council, Inc.

December 2-7, 1935, New York, N. Y.—Exposition of Chemical Industries.

December 9-12, 1935, Miami, Fla.—Annual convention, American Assn. of State Highway Officials.

February 25-28, 1936, Wichita, Kans.—Ninth Annual Southwest Road Show and School, Exposition Bldg.

NEW CORPORATIONS

WING SANDS, INC., Beloit, Wis. To engage in the sand and gravel business. Incorporators, M. E. Wing, M. R. Wing and Edward C. Frederick.

THE MINERAL PRODUCTS CO., Thomasville, Ga. Capital $50,000. Organized to develop deposits of fullers' earth.

THE DETROIT FOUNDRY SAND & SUPPLY CO., Detroit, Mich. Capital $50,000 of which $20,000 is paid in.

WEST VIRGINIA QUARRIES CO., Charleston, W. Va. Capital $5,000. Incorporators, G. F. Atkins, V. C. Lytle, and W. D. Edwards, all of Findlay, O.

DILLE BOTTOM SAND & GRAVEL CO., Columbus, O. Capital 500 shares n.p.v. Incorporators, James W. Dillon, J. E. Fox and H. M. Jones.

RIVERTON LIME AND STONE CO., INC., Riverton, Va. Capital $239,000. To manufacture, buy, sell and deal in lime and cement.

CHEROKEE CONCRETE CO., Knoxville, Tenn. Capital $60,000, initial capitalization $1,000. Incorporators, George P. Chandler, C. L. Carmichael and W. C. Kinxel. To quarry stone and manufacture cement and concrete.

MIAMI ROCK PRODUCTS CO., Miami, Okla. Capital $100,000. Incorporators, H. B. Cobban and W. J. Martin.

THE JOPLIN MARBLE QUARRIES, INC., Joplin, Mo. Incorporators, George H. Spiva and Z. Spiva.

THE NU-CARTH STONE CO., Carthage, Mo. Capital $3,300. Incorporators, E. H. Wetzel and Luke J. Boggess.

Survey Shows Sand-and-Gravel Output 2.8 Tons Per Man-Hour in 1933

By H. H. HUGHES, M. ALLAN AND M. SCHAUBLE

United States Bureau of Mines

FEW data on employment in the sand-and-gravel industry have ever been collected. The Census of Mines and Quarries for 1929 reported 15,994 wage earners employed in 957 enterprises operating 1,165 plants, and accounting for production of 168,885,667 short tons of sand and gravel. The canvass of the Census of Mines and Quarries excluded enterprises producing less than 25,000 tons during the year, operations of states, counties, municipalities, railroads, and public utilities, and plants engaged in the production of glass or molding sands.

In the canvass for 1933 the Bureau of Mines for the first time asked sand-and-gravel producers to report data on employment. Three questions were included on the schedule: (1) Average number of men employed during the year, (2) number of days the plant was operated, and (3) length of the working day. Returns were received from companies accounting for 71.4 per cent. of the commercial production.

Data summarized in Table I cover only those plants for which returns actually were received; no estimates for missing companies have been included. The table is set up by regions as established in the Code of Fair Competition. The average number of men employed, total man-shifts, and total man-hours have been calculated from data reported on the schedules. From these totals the average number of days in operation and the average number of man-hours per man per day have been computed for each region and for the United States. The quantity of sand and gravel produced at plants included in the study is shown in the table, as well as the percentage of total commercial production represented. Finally, computations have been made to show the average output of sand and gravel per man-shift and per man-hour.

A total of 12,536 men are represented in the study, which includes 71.4 per cent. of commercial production. Assuming that production at the rest of the commercial plants was at approximately the same rate, it follows that about 17,500 men were employed by the sand-and-gravel industry during the year. The average number of days of employment throughout the year, however, amounted to only 155. The average shift was 8.7 hr.

The output of sand and gravel per man-hour ranged from 1.6 tons in Region 4 and 1.7 tons in Region 7 to 3.9 tons in Region 12 and 4.5 tons in Region 10. The figure of 18.2 tons per man-hr. for Region 14 is not comparable to other regions because it is weighted heavily by the highly mechanized sand-and-gravel operations at Boulder Dam.

The apparent total employment in 1933 was higher than that reported by the Census for 1929. These figures, however, are not strictly comparable. Furthermore, the average number of days of operation in 1929, although not definitely stated in the Census report, must have been at least 250 according to data given in a table showing a summary of enterprises classified according to number of days in operation. In addition, the average shift in 1929 in all probability was at least 10 hr. Actual man-hours of employment in the sand-and-gravel industry in 1929 probably exceeded 40,000,000, whereas total man-hours of employment in 1933 apparently were only about 23,000,000. These figures are approximations only but they indicate a reduction of nearly 50 per cent. in man-hours of employment in the sand-and-gravel industry from 1929 to 1933. Commercial production dropped more than 60 per cent. during this period.

Diversification of Products.—Sand-and-gravel and crushed-stone operations range in size and activity from the small portable plant producing unprepared road gravel to the com-

Table I.—EMPLOYMENT IN THE COMMERCIAL SAND-AND-GRAVEL INDUSTRY, SAND AND GRAVEL PRODUCED AT PLANTS INCLUDED IN THE STUDY, AND AVERAGE OUTPUT PER MAN IN THE UNITED STATES, 1933, BY CODE REGIONS[1]

Region	Employment					Production			
	Average Number of Men	Time Employed				Commercial Sand and Gravel (*short tons*)	Per cent. of Total Commercial	Average per Man (*short tons*)	
		Average Number of Days	Total Man-shifts	Man-hours				Per Shift	Per Hour
				Average per Man per Day	Total				
1. Maine, New Hampshire, Vermont, Rhode Island, Massachusetts, and Connecticut	444	119	52,700	8.5	445,885	1,368,647	62.4	26.0	3.1
2. New York	924	148	136,976	8.4	1,152,555	3,269,825	51.8	23.9	2.8
3. Pennsylvania, New Jersey, and Delaware	1,662	173	287,861	9.1	2,610,856	5,138,909	78.6	17.9	2.0
4. West Virginia, Virginia, Maryland, and District of Columbia	834	269	224,481	8.4	1,880,521	3,001,665	71.3	13.4	1.6
5. South Carolina, Georgia, Alabama, Florida, and Mississippi	398	131	52,056	9.0	468,085	1,356,564	60.3	26.1	2.9
6. North Carolina, Kentucky, and Tennessee	488	149	72,650	8.6	626,044	1,417,047	65.9	19.5	2.3
7. Arkansas, Louisiana, and Texas	1,447	178	257,780	9.0	2,316,410	3,956,350	77.6	15.3	1.7
8. Ohio	1,049	167	175,326	8.5	1,495,915	3,025,132	84.0	17.3	2.0
9. Illinois and Indiana	1,498	152	228,353	9.3	2,120,751	7,694,970	86.0	33.7	3.6
10. Michigan and Wisconsin	955	108	102,885	9.3	952,461	4,239,434	86.2	41.2	4.5
11. North Dakota, South Dakota, and Minnesota	470	68	31,893	8.4	266,897	934,073	63.3	29.3	3.5
12. Nebraska and Iowa	609	121	73,527	8.1	593,810	2,317,021	78.0	31.5	3.9
13. Kansas, Missouri, and Oklahoma	909	147	133,666	8.1	1,076,263	3,579,755	84.6	26.8	3.3
14. Wyoming, Colorado, New Mexico, Utah, and Arizona	153	168	25,632	8.1	206,430	3,751,107	91.7	146.3	18.2
15. California and Nevada	308	159	48,998	8.0	391,666	1,220,148	24.5	24.9	3.1
16. Montana, Washington, Oregon, and Idaho	388	109	42,441	7.9	333,313	944,476	44.4	22.3	2.8
Total United States	12,536	155	1,947,225	8.7	16,937,862	47,215,123	71.4	24.2	2.8

[1] Does not include plants operated by or directly for states, counties, municipalities, and other government agencies.

Table II.—APPROXIMATE NUMBER OF PLANTS (OR COMPANIES) REPORTING PRODUCTION OF SAND AND GRAVEL, AND STONE IN 1933, BY USES

Material Produced	Number of Plants	Material Produced	Number of Plants
Sand:		Stone:	
Glass	37	Crushed stone (concrete and road metal)	1,335
Molding	215	Railroad ballast	240
Building	1,025	Riprap	240
Paving	810	Flux	130
Grinding and polishing	60	Sugar	40
Fire or furnace	37	Glass	20
Engine	220	Paper	25
Filter	23	Agriculture	325
Railroad ballast	42	Alkali	11
Other	175	Other	250
Gravel:		Total stone operations, excluding duplications	1,640
Building	800		
Paving	890		
Railroad ballast	185		
Other	130		
Total sand and gravel operations, excluding duplications	1,938		

pletely-integrated commercial plant producing a wide variety of products. The diversification of products of plants reporting to the Bureau of Mines is summarized in the accompanying tables.

Table II shows the approximate number of plants, or in a few instances companies operating more than one plant, reporting production of various kinds of sand and gravel and stone in 1933. For example, the table shows that 37 plants reported the production of glass sand and 1,025 plants reported building sand. Of course, there are many duplications because numerous plants report several products. A total of 1,938 sand-and-gravel operations are in the table, exclusive of duplications. The stone section of the table shows that 1,335 plants report crushed stone for concrete and road metal. Likewise, 240 reported railroad ballast, but only 11 reported stone for use in alkali works.

Table III shows a frequency distribution of sand-and-gravel and stone plants according to the number of products reported in 1933. For example, 655 sand-and-gravel plants, representing 33.8 per cent. of the total operations included in the study, reported the production of only one product. Six hundred and ten plants reported two products, and one plant reported 11 different products. Similar data are shown for stone; 1,070 plants, representing 65.3 per cent. of the total, reported only one product, crushed stone. Ten plants reported seven products, but none reported more than seven.

Table III.—FREQUENCY DISTRIBUTION OF SAND-AND-GRAVEL AND STONE PLANTS (OR COMPANIES) ACCORDING TO THE NUMBER OF PRODUCTS REPORTED, 1933

Number of Products	Sand and Gravel	Percentage of Total	Stone	Percentage of Total
1	655	33.8	1,070	65.3
2	610	31.5	335	20.4
3	240	12.4	145	8.9
4	260	13.4	50	3.0
5	85	4.4	20	1.2
6	60	3.1	10	.6
7	20	1.0	10	.6
8	4	.2	...	...
9	2	.1	...	...
10	1	.05	...	...
11	1	.05	...	...
Total Operations	1,938	100.0	1,640	100.0

Distributor Holds Outdoor Exhibit at Long Island City

The Forsythe Equipment Co., 37-01 Vernon Ave., Long Island City, N. Y., on August 16 opened an interesting exhibit of machinery and equipment which is to continue until Sept. 16. The location of this exhibit is adjoining the Madison Square Garden Bowl on Northern Boulevard at 43d St., Long Island City. The site has been attractively landscaped and ample parking space is available.

Included in the exhibit is a wide range of equipment including crawler shovels and cranes, truck shovels and cranes, portable air compressors, rock and wagon drills, pumps, loaders, Diesel and gasoline engines, etc. Manufacturers represented in this exhibit include the Manitowoc Engineering Works, Worthington Pump & Machinery Corp, Michigan Power Shovel Co., Novo Engine Co., Hercules Motor Co., American Steel & Wire Co., and others.

Explosive Company Officials Cover Territory in Cabin Plane

Officials of the Halafax Explosives Co. have at their disposal one of the finest equipped cabin planes in the United States. Both sales and supervision work in the widely separated areas of the Pacific Southwest dictate the use of this most modern method of transportation—the private plane. With headquarters in Los Angeles, Cal., the Halafax Explosives Co. is favorably located so that its executives may make flying trips to the many varied quarrying, mining and construction projects where their products are in use.

Specifications of the latest model Northrup ship, as outlined by Halafax executives are interesting. The plane embodies every modern engineering development for the safety and comfort of its passengers, powered by a single Pratt & Whitney Wasp Motor, it has a cruising radius of 3,000 miles; its top speed is approximately 225 miles per hour, its cruising speed 180 miles per hour. Wing flaps for low landing speeds, retractable landing gear for full streamline performance in the air, adjustable pitch propeller for obtaining fast cruising speeds and low landing speed, are all part of the plane's equipment. It is also equipped with a sending and receiving radio permitting two-way conversation between pilot and ground stations.

The exterior of the plane is finished entirely in duralumin; the interior, with sleeping quarters for two, boasts of the luxuriousness of a fine home. Bill Hottle, former transport pilot with one of the major airlines, is the pilot of the Halafax plane and has many thousands of hours of flying to his credit. He is familiar not only with flying conditions in this country, but also has had considerable experience in transport work in Central America.

Cabin plane and one of cars used by officials of Halafax Explosives Co. in covering territory.

Publish Official List of Government Buying Agencies

The Machinery Division of the Bureau of Foreign and Domestic Commerce has issued a mimeographed eighteen-page unofficial list of Government Purchasing Agencies including the principal offices in Washington and the field offices all over the country, for the use of firms desiring to sell machinery and similar equipment to the various departments of the U. S. Government. A limited number of copies are available from the Bureau of Foreign and Domestic Commerce.

Granted Patent on Method of Welding Alloy Steels

The Morrison Railway Supply Corp., Buffalo, N. Y., announces that, with the grant of patent No. 1994479 it receives the right to control the use of its perfected method of welding alloy steels. This method involves the combination of electric arc welding on manganese steel, using an electrode containing nickel, in the building up of manganese railroad frogs and crossings, crushers, dipper teeth, and other manganese parts. A set-up has been established whereby industrial establishments, railroads, etc., may obtain a license to use this patented process.

New Dealer Agents Are Named by General Refractories Co.

The Broadway Manufacturing Co., Knoxville, Tenn., and Shadbolt and Boyd Co., Milwaukee, Wis., have been appointed Dealer Agents in their respective areas by the General Refractories Co., Philadelphia, Pa. Both companies will carry a complete stock of refractories.

The Bucyrus-Erie Co., So. Milwaukee, Wis., announces the appointment of the F. C. Crane Co., 1301 S. Lamar St., Dallas, Tex., as distributor for the sale of power shovels, draglines, cranes, clamshells and skimmer scoops in the central and eastern part of Texas.

Foreign Developments

Investigates Effect of Glue on Cement Mortars

In a paper read at a recent Congress of Industrial Chemistry, reported in summary in *Revue des Materiaux de Construction et de Travaux Publics* for May, 1935 (No. 308, pages 129-130), H. Lafuma discusses some experiments made in collaboration with M. Dubrisay of the Laboratoire des Ponts et Chaussees on the admixture of bone glue with various cement mortars: slag cements, Portlands, aluminous cements, extra white (siliceous), and puzzuolanic cements. It was found in general that glue appreciably retards the set of Portland and siliceous cements and seems to be almost without effect on the set of cements rich in alumina (slag and aluminous cements).

The strength tests were made with 1:5 mortars mixed with 3 to 5 per cent. glue solutions and stored in soft water. In general glue tends to diminish slightly the resistance to tension and to wear. It increases a little the resistance to crushing, except for the aluminous cements.

From the point of view of permeability glue improves appreciably the hydraulic mortars, so long as they do not exceed a certain concentration in the order of 60 g. per liter of gauging water. The effect of glue is the more pronounced as permeability without glue is greater, and the result differs with the nature of the cement. It is less in the case of an aluminous cement than for a Portland cement.

Shrinkage was studied on a neat paste and a standard 1:3 mortar. It appears that glue has no perceptible effect on shrinkage.

Glue increases the solubility of lime. It slows down the hydration of Portland cement, from which results a retarding of the set; in spite of the increase in solubility, up to four days there is less lime in solution with glue than without glue. In the glue solution there seems to be no supersaturation; the concentration remains, for Portland cement, less than what it is for lime, contrary to that which is true with water alone. The crystals of lime hydrate which form against the vessel with water alone do not form in the presence of glue.

With aluminous cement supersaturation is greatly attenuated and hydrolysis is considerably diminished by the glue. There probably forms an insoluble combination of gelatin and calcium aluminate.

The increase of solubility of the lime by glue is overcome beyond a certain concentration (about 6 per cent.) to a brusque increase of permeability which cancels the other effect of glue to increase impermeability. It seems that, along with its chemical action, glue has a physical action the result of which is to diminish the section of the capillary canals which produce permeablity.

Gradation Represented In Logarithmic Curves

The representation and evaluation of the gradation of the particles of a granular material are discussed at length and in detail by Dr. E. Bierbrauer and Dr. F. Hönig in *Zement* for May 9 and May 16, 1935 (24:285-290, 301-305). The graphical representation of the gradation by use of logarithms is developed and strongly urged as most clearly evaluating the gradation for scientific and practical purposes. From this the authors pass to the graphical determination of the surface of grains in a heap, and the question of index figures for representing the gradation of a given mix.

Cements from Magnesia And Magnesium Sulfate

Magnesium sulfate cements are made from a mixture of anhydrous magnesia MgO with magnesium sulfate dissolved in water. Tests made in studies reported at the Congress of Industrial Chemistry were confined to the pure paste, without fillers, and gave the following principal results:

(1) The volume of sulfate solution which should be added to a given weight of magnesia increases slightly with concentration of the liquid employed. The time of set, at ordinary temperature, diminishes as the concentration of the solution increases.

(2) The hardness was determined by the Brinell test after periods varying from 7 days to 10 months. The rate of hardening, at first rapid, decreases with time and after 4 months the hardness no longer varies. It is independent of the concentration for contents below 200 gr. of sulfate per liter. For higher contents, the hardness increases very rapidly with the concentration.

(3) Tensile strength seems to increase slightly with the concentration. It depends a great deal on the atmospheric conditions at the place where the hardening takes place (humidity and content in carbon dioxide).

(4) Shrinkage (measured only for concentrations greater than 300 gr. per liter) is over after 28 days. It increases with the concentration up to 600 gr. per liter and remains constant thereafter.

(5) The free lime which the magnesia may contain is disastrous for cements after 10 per cent. The expansion is such that the mixture no longer sets. On the other hand, the magnesium chloride which may occur in the sulfate solutions does not change the mechanical properties.

(6) The adhesion of the oxysulfate cement to ordinary Portland cement after 2 months is still very good after 6 months. The attack of the cement by sulfate solutions is much less than that of solutions of magnesium chloride.

On the basis of the comparatively short-time tests reported, the magnesium oxysulfate cements do not seem inferior to the oxychloride cements from the point of view of price, ease of manufacture, hardness and shrinkage. They are superior in their resistance to moist air and to water and in their chemical inertness compared to Portland cement.—L. J. Olmer and Mlle. M. L. Delyon in *Revue des Materiaux de Construction et de Travaux Publics*, No. 309, June, 1935, p. 150.

Theoretical Heat Used in Calcining Limestone

The thermal value of 425 cal. per gram for the dissociation of carbon dioxide from limestone is strictly true only at room temperature of 20 deg. C., although it is the figure that has long been used in theoretical calculations of the heat required for the burning of cement. The temperature at which limestone is calcined is a little over 900 deg. On the basis of the specific heats of CaO (0.2129), $CaCO_3$ (0.2657) and CO_2 (0.2551) between 20 and 900 deg., the authors calculate the value of the heat employed in calcination as follows:

1. Warming 1 kg. of $CaCO_3$ from 20 to 900 deg. The heat consumed in this process is $1000 \times 880 \times 0.2657$, that is, 234 cal.

2. 1 kg. of $CaCO_3$ is at 900 deg. dissociated into 560 g. of CaO and 440 g. of CO_2. This step represents the thermal value that is sought, that is, x cal.

3. 560 g. of CaO cool from 900 deg. to 20 deg. The following quantity of heat is recovered: $560 \times 880 \times 0.213$, that is, 105 cal.

4. 440 g. of CO_2 cool from 900 to 20 deg. The following quantity of heat is recovered: $440 \times 880 \times 0.2551$, that is, 99 cal.

5. The heat of forming $CaO + CO_2 = CaCO_3$ at 20 deg. is for 1 kg., 425 cal.

From these the heat required in the calcining of limestone to lime and carbon dioxide is calculated at $-234 - x + 105 + 99 + 425 = 395$ cal. per kg. of $CaCO_3$. The authors are using this figure in some present further studies on the heat requirement for the burning of cement.—H. Elsner v. Gronow and H. E. Schwiete in *Zement* 24:271-272, May 2, 1935.

Traffic News and Comment

Motor Carrier Act, 1935.—The most important piece of transportation legislation since the passing of the Act to Regulate Commerce, is the Motor Carrier Act, 1935, which becomes effective October 1 this year. The act is really an amendment to the Interstate Commerce Act, the text of which previous to this amendment is to be known as "Part I," this amendment being "Part II."

The provisions of the Act apply to all motor vehicle transportation in interstate commerce although private carriers are only subject to the provisions relating to hours of service and safety. The provisions of Part II are very similar to those of Part I except that the Commission has no power over intrastate rates even though such rates are prejudicial to interstate commerce. This part also gives the Interstate Commerce Commission jurisdiction over brokers who sell or offer to sell interstate motor transportation and provides for the licensing of brokers.

Carriers exempt from the provisions of Part II, except the labor and safety provisions are school busses, taxicabs having a capacity of not more than six persons, hotel cabs, national park busses, motor vehicles owned and operated by a farmer used in the transportation of products of, or supplies used on his farm, trolly busses, motor vehicles operated by farmers' cooperative associations, motor vehicles used exclusively in carrying live stock, fish, shell fish, agricultural commodities or newspapers. Unless the Commission shall find the application necessary the provisions of this part will not apply to motor vehicles used in the transportation of persons or property within a municipality or a zone contiguous to and commercially a part of the municipality, or to the casual or reciprocal transportation for compensation by any person not regularly engaged in transportation by motor vehicle as a regular business.

It shall be the duty of the Interstate Commerce Commission to regulate common and contract carriers by motor vehicle, and to that end the Commission may establish reasonable requirements with respect to continuous and adequate service, transportation of baggage and express, uniform system of accounts, records and reports, preservation of records, qualifications and maximum hours of service of employes, and safety of operation and equipment.

The Commission may inquire into the organization of motor carriers and brokers and into the management of their business, and transmit to Congress from time to time, recommendations for such legislation as it may deem necessary.

Complaints as to the violation of any of the provisions of this part of the Act, or of the requirements of the Commission may be brought before the Commission by any person, State board, organization or body politic, or upon its own motion without complaint the Commission may investigate whether a carrier has failed to comply with such provisions or requirements; which follows the provisions of the first part relating to rail carriers. Different provisions than those applying in the case of rail carriers have been set up in the case of the operations of a motor carrier involving not more than three states, in which case the Commission shall refer the case to a joint board for appropriate proceedings thereon, applications for certificates, permits or licenses and complaints as to fares, rates and charges, as well as the approval of consolidations and mergers. An examiner may be assigned to assist the board. This joint board is to consist of one member from each state involved, the member having been nominated by the state commission having jurisdiction over motor carriers and approved by the federal commission. The Commission, examiners and joint boards are given power to administer oaths, and to require by subpena the attendance and testimony of witnesses and the production of such documents as are required.

Certificates of public ronvenience and necessity are required of all common carriers, and permits are required of all contract carriers in interstate commerce, the certificates and permits to be granted by the Commission as it deems advisable, but carriers in operation on June 1, 1935, are to be given certificates or permits by right of such operation.

The Commission is given jurisdiction over the consolidation, merging and acquisition of control and over the issuance of securities when the total issue of securities is more than $500,000. It also is required to establish reasonable requirements as to surety bonds and insurance for the protection of the public.

The provisions governing the establishment of through routes and joint rates, publication of tariffs, establishment of reasonable rates, the prohibition of undue preference and prejudice, jurisdiction over divisions of charges and suspension and investigation are practically the same as those governing rail carriers.

Contract carriers are required to post and file their schedules or copies of their contracts, and no reductions are to be made in the charges until the proposed change has been filed and posted for thirty days, unless the Commission permits such change to become effective on less than the thirty days notice. The Commission is given the power after investigation to fix the rates and charges and the rules and regulations governing the transportation of persons and property by contract carriers.

The provisions of Part I relative to bills of lading, will also apply to carriers by motor vehicle.

The penalty for violation of the Act by a motor carrier is not to exceed $100 for the first offense and $500 for any subsequent offense, each day of such violation constituting a separate offense. Any person giving, offering, soliciting or accepting a rebate, concession or discrimination, or by means of false billing, or otherwise, shall willfully assist, suffer or permit any person to obtain transportation at less than the lawful rate, or shall fraudulently seek to evade or defeat the provisions of this part, are subject to a fine of not more than $500 for the first offense and not more than $2,000 for any subsequent offense. Any special agent or examiner who divulges any information coming to his knowledge during the course of his examination of the books and accounts of a carrier, is subject to a fine of $5,000 and two years imprisonment.

The Commission may require interstate carriers to display suitable identification plates. It is further authorized to investigate and report on the need of federal regulation of the sizes and weight of motor vehicles and of the qualifications and maximum hours of service of employes of motor carriers.

The Motor Carrier Act is to become effective on October 1, 1935, although the Commission may stay the effective date of any part or all of it until April 1, 1936. The Act was signed by the President on August 9, and the next day the Commission announced that Coordinator Eastman would head a division of the Commission having charge of motor carrier regulation, and that Hohn L. Rogers, who has been executive assistant to the coordinator for the past two years would be director of the newly created Bureau of Motor Carriers. The new division will be number 7 and Commissioners McManamy and Lee will be the other two members.

It is now planned to have district offices of the Bureau in fifteen or twenty important transportation centers in charge of a district director.

According to the coordinator, there are some 325,000 trucks and 700 busses in common and contract carrier operation in interstate commerce.

Recent I. C. C. Decisions

Aggregate of Intermediates.—On further hearing the Commission has reversed the decision in 195 I. C. C. 775 and 198 I. C. C. 39 covering the use of a restricted local rate to make a lower combination than the published through rate. In publishing a proportional rate it is generally restricted in its application to apply only on traffic from a designated area to another designated area. Some tariffs have restricted certain local rates, not permitting them to be used in the construction of combination rates. This is true of some rates that have been published in an effort to meet motor truck competition. While the decision in the instant case applies to shipments of automobiles and parts the principle laid down in this case will also apply to rates on non-metallic minerals. The great number of truck competitive rates being published may result in through rates for longer distances being higher than a combination of local rates and even though such local rates are restricted in their application the through rate will be in violation of the fourth section of the Act to the extent it exceeds the combination of intermediate rates. I. C. C. Docket No. 24,343, Moore Bros. *et al. v.* C. B. & Q. *et al.*, and No. 24,709, Divine *v.* Michigan Central.

Cement.—In decisions covering fourth section applications on cement in New England and in Trunk Line territories, and a separate decision covering the southwest, the Commission has granted relief from the long and short haul clause of the fourth section with the usual equidistant limitation. These cases cover a large number of applications and citations will be furnished on request.

The Pere Marquette has been ordered to quit furnishing a locomotive for switching within the plant of the Petosky Portland Cement Co. at Petosky, Mich., not later than Sept. 23. I. C. C. *Ex Parte* No. 104, Part 2.

The Pennsylvania has been ordered to quit making an allowance for spotting service at the Speeds, Ind., plant of the Louisville Cement Co., not later than Sept. 30. I. C. C. *Ex Parte* No. 104, Part 2.

New Complaints Filed

Sand.—Reparation is sought and violation of section 1 alleged on rates on sand from Selkirk, N. Y., Wilbren, O., and Asuanba, Ky., to Peru, Ind., in I. C. C. Docket No. 27,080, Peru Foundry Co., Peru, Ind. *v.* C. & O. *et al.*

New rates and reparation are prayed for and a violation of section 1 charged on rates on moulding and glass sand from Van Hosen and Brookview, N. Y., to Terryville, Conn., and from Mapleton, Pa., to Hartford, Conn., in I. C. C. Docket No. 27,086, Hartford-Empire Co., *et al.*, Hartford, Conn. *v.* N. Y. N. H. & H. *et al.*

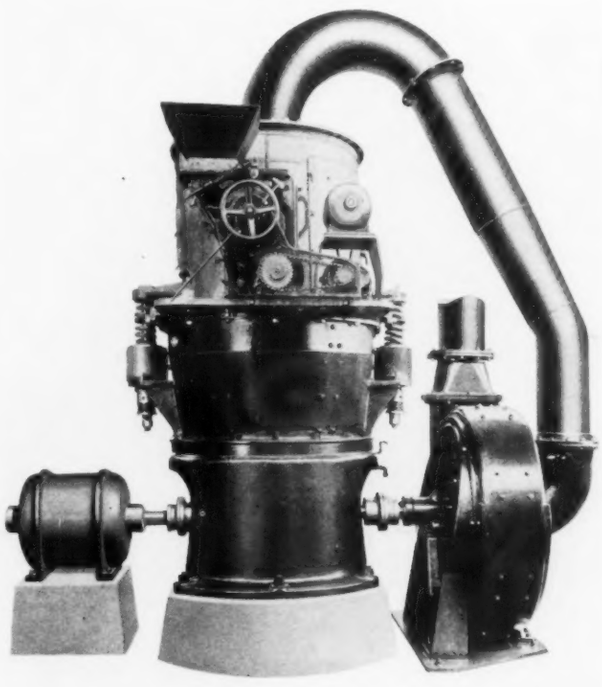
Reasonable rates and reparation are sought on sand from points in Ohio, New York and Illinois, to Coldwater, Mich., in I. C. C. Docket No. 27,096, W. J. Carlyle, receiver for Homer Furnace & Foundry Corp., Coldwater, Mich. *v.* N. Y. C. *et al.*

Sand and Gravel.—The rates on sand and gravel from points in Nebraska to destinations in Nebraska, Iowa, Missouri and Kansas, have been attacked under section 3, with undue preference for competitors shipping from Blue Rapids and Topeka, Kans., alleged in I. C. C. Docket No. 27,079, Lyman-Ritchie Sand & Gravel Co., *et al.*, Omaha, Neb. *v.* C. & N. W.

New Machinery and Supplies

Revolving Grinding Chamber Feature of New Bowl Mill

A radical departure from conventional types of pulverizers is represented by the Raymond Bowl Mill, just announced by Raymond Bros. Impact Pulverizer Company of Chicago. This machine has been under development for a considerable period and has been subjected to extended service tests, including nearly a year's commercial service in one of the well known utility plants. Its design makes for low friction losses, hence low power consumption, quiet running and low maintenance, because of no metal-to-metal contact between the bowl and the rolls. Adjustment may be made from the outside while the mill is running. These two last mentioned points make for high availability. The speed is constant with the output controlled by varying the rate of feed. Mill power is almost directly proportional to the load. The mill is adapted both to direct firing and to storage systems in coal grinding operations. It is also highly efficient for pulverizing other non-metallic minerals and various manufactured products.



New Bowl Mill has revolving grinding chamber with clearance adjustable while running.

The unique feature of the mill is a revolving bowl, or grinding chamber. Due to centrifugal force, the coal which is ground between the reduction rolls and the grinding ring, works its way up the inclined walls of the bowl. As the ground particles reach the rim, the fines and intermediate sizes are picked up by the air current coming up from the annular spaces around the bowl and are carried into the separator above for further classification. As the finished material is separated out, the oversize drops back and re-enters the mill with the raw feed.

The rolls are held in a fixed position by the heavy journal heads, supported on trunnions that rest on the top plate of the mill. Clearance between the rolls and the revolving bowl may be adjusted from the outside while the mill is running. The journal heads are connected through arms to roll pressure springs and adjustment rods, mounted in cast-iron lugs outside the mill casing. By adjusting these compression springs, the grinding pressure can be controlled to suit the requirements of the coal while the mill is running.

The bowl revolves on a vertical shaft, mounted on roller bearings, and is driven through a worm gear by a horizontal main shaft, direct-connected to a constant-speed standard motor. The vertical shaft and bearings are outside the grinding compartment, and are lubricated by a continuous circulation of oil.

The mill parts are protected from damage resulting from tramp iron or other ungrindable material by a positive means of disposal. The pressure springs allow pieces of iron to pass the rolls without injury, and when the tramp iron reaches the top of the bowl, it is thrown into the annular space below and expelled by revolving plows through a discharge.

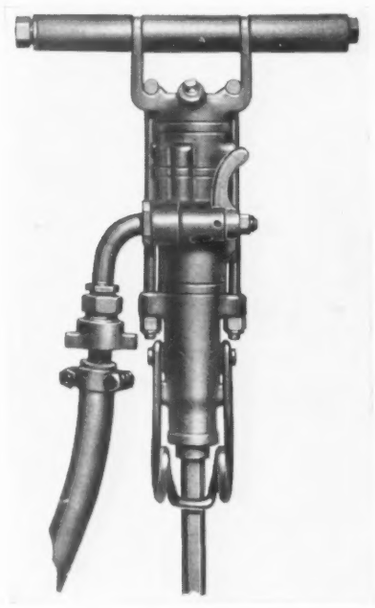
For coal grinding and firing, the Bowl Mill is equipped with an air separator and automatic feeder, both mounted on the top plate. The exhaust fan is driven from an extension of the horizontal main shaft, so that one motor drives the fan and the mill. Hot air may be passed into the grinding chamber, when necessary for drying the coal.

An outstanding advantage of the Bowl Mill is its ability to give uninterrupted operation over long periods without shut-downs. Every detail and function of the mill are designed for endurance: an unfailing lubrication system, in which all moving parts can be oiled from the outside while the mill is running; oversize shafts mounted on high class bearings; exterior provision for adjustment of face alignment of rolls to compensate for wear; simplicity of design with few wearing parts, and these of extra rugged construction.

The Bowl Mill is said to be ideally adapted to direct firing, as it runs at constant speed, and the output is controlled by varying the rate of feed by means of the variable transmission on the automatic feeder. The perfectly balanced operation, massive construction, extra fine bearing units, automatic lubrication and the elimination of metal-to-metal contact in grinding, are all said to be factors contributing to the smooth, silent, vibrationless operation of the mill.

Design Lightweight Drill for Soft Shallow Drilling

The Chicago Pneumatic Tool Co., New York, N. Y., announces the new CP-22 dry sinker drill and the CP-22W wet sinker, both lightweight units designed for shallow drilling in soft to medium formations. Its small size, light weight and low air consumption are said to make it an ideal drill for use in restricted quarters, flat and upward drilling, and where the air supply is limited. It also has application for blockholing in quarries. The dry unit weighs 28 lb., has an overall length with retainer of 19⅞ in., has an economical drilling depth of 6 to 8 feet, and requires a ¾-in. air hose.



Lightweight sinker drill for shallow work in soft formations.

Aluminum Alloy Used in Lightweight Shovel Dipper

The American Manganese Steel Co., Chicago Heights, Ill., announces the manufacture of composite-type power-shovel dippers of unusually light weight which employ aluminum alloy and high-tensile rolled steel for parts not subjected to the heaviest abrasion. It is said that this new type dipper in the larger sizes can weigh less than one-half as much as the solid all-cast type, allowing a great increase in shovel capacity without any increase in power consumption. Dippers of

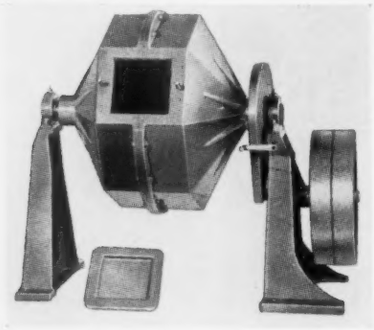
A 15-cu.yd. shovel dipper of the composite type employing aluminum alloy.

this composite design have a top casting of manganese steel of complete double-wall construction, with integral bases and bail connections. The bottom casting, also of manganese steel, is also double-walled at the back where the dipper stick is connected. The front plates are high-tensile rolled steel welded with spacers to form a double wall between top and bottom castings. The back plate is of rolled aluminum alloy while the back braces connecting top and bottom castings are cast aluminum alloy. The door is a one-piece manganese steel casting with integral hinges.

A 15-cu.yd. Amsco composite dipper was recently shipped to a large coal company for use in stripping coal. It replaced a 12-cu.yd. solid dipper and the added capacity is completely offset by the lighter proportional weight of the new bucket. This dipper weighs 32,940 lb.

Tumbling Barrel Designed for Wet or Dry Grinding

The Hartford Steel Ball Co., Hartford, Conn., is marketing a triple-action cutting barrel suitable for wet or dry grinding, pulverizing or mixing. Rotation of the barrel is said to impart a tumbling action to the material within it and the inside of the barrel is constructed to produce a rapid flowing motion. Features include self-aligning Hyatt roller bearings, roller chain drive running in oil bath, and special belt shifter which locks "on" and "off." Body castings are made of a special alloy said to insure long life.



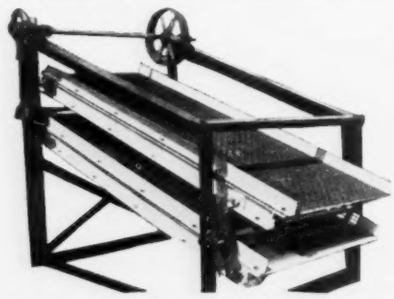
Triple-action barrel which is suitable for wet or dry grinding or mixing.

All-Steel Welded Drill Has New Shock-Absorbing Spudder

The Star Drilling Machine Co., Akron, O., announces the new Speed Star No. 71 drilling machine for water wells, blast holes and mineral prospecting. This machine is a completely self-contained unit of rugged all-steel welded construction. Among the features of this machine is a new shock-absorbing spudder which is said to make the wire line operate as resiliently as manila cable and allow operation at speeds up to 60 strokes per minute. In either raising or lowering the mast the top braces stay connected, folding under as the mast is lowered. The mast is 33 ft. high and telescopes to 22 ft. The braces are ample for ordinary work, guy wires being necessary only for extremely heavy duty. The power unit is a 35-hp., 4-cyl., gasoline engine mounted on rubber with an adjustable base for tightening the V-belt drive. SKF ball bearings are used on the power takeoff. This machine is available in several trailer models with steel or rubber tired wheels, in addition to a truck model.

New Shaker Screen Adjustable for Throw and Length of Stroke

The Continental Screen Co., Kokomo, Ind., announces a new shaker screen for which many advantages are claimed. This screen operates in an all-welded steel frame which comes ready to install. It is operated by means of a drive shaft on one end of which is an eccentric mechanism. This transmits an up-and-down motion to a lever connected to a horizontal shaft. On this shaft arms are attached which are connected to the upper and lower decks of the screen at each side and which impart a forward and upward thrust to the decks. Provisions are made for the adjustment of the throw to any degree and three adjustments in length of stroke are available.

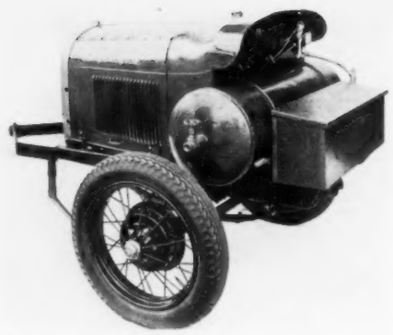


Shaker screen with opposed decks and adjustable stroke and throw.

Because of the directly opposed motion of the upper and lower decks vibration is kept to a minimum. Because of the comparatively slow speed of this screen the power requirement is low. In one installation a 4-deck 3 by 7-ft. screen is being operated at capacity by a 2-hp. motor. Accurate grading combined with high production is claimed for this screen and it is said that the sand screens will not blind.

Convert Automobile Engine to Motor-Driven Air Compressor

Gordon Smith & Co., Bowling Green, Ky., have developed a motor-driven compressor converted from a Model A Ford motor. Cylinders 1 and 4 of this 4-cyl. motor are used for power and cylinders 2 and 3 for compressing the air. The head has the same combustion space and water jacket over the power cylinders as the standard head but has no water jacket over the compression cylinders. This middle section has no combustion chamber and the valves are seated tight. At 1,500 r.p.m. the compressor has a displacement of 87 cu. ft. and it has ample power to compress up to 175-lb. pressure. This machine is mounted on a two-wheeled portable trailer which may be pulled behind a car or truck. An automatic control system consists of a motor governor to hold a constant speed from zero to maximum pressure, a pilot valve which opens and closes at predetermined maximum and minimum pressures, unloader cylinders controlled by the pilot valve and an idling device for slowing the motor to the idling speed when the compressor is unloaded.



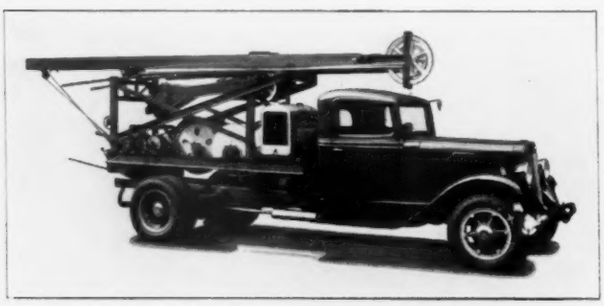
Portable motor-driven air compressor converted from automobile engine.

Automatic Variable Speed Control for Air Compressor

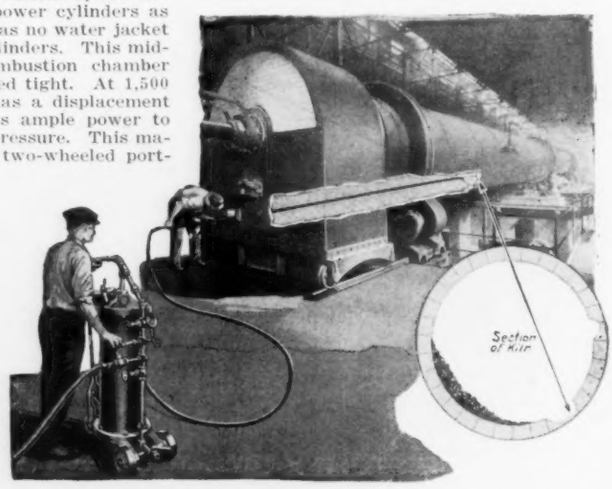
The Amplex Division of the Chrysler Corp., Detroit, Mich., announces a new development consisting of a device for complete automatic variable speed control for use in connection with Chrysler portable compressors. The control is so designed that the speed of the engine and compressor is regulated automatically by the load or demand for air at a given time. As air tools are added to or taken off the compressor line the speed of the engine increases or diminishes as the case may be. The new device is interconnected with the Chrysler automatic unloading and maximum speed control.

Premixed Plaster Refractories Applied by New Pressure Gun

The Quigley Co., Inc., 56 W. 45th St., New York, N. Y., announces the Quigley refractory gun for scientific mechanical application of refractories in plastic form. With this gun, it is said, it is possible to fill cracks or holes, restore burned-out walls, surface new walls or resurface old ones, repair leaky baffles and build new monolithic baffles that are air and gas-tight. An advantage of this gun is that it handles premixed, properly seasoned refractory mixtures of the proper consistency for the job. Because of the force of application it is said that the mixture will stick to hot or cold surfaces where



Self-contained all-steel welded drill rig with shock-absorbing spudder shown mounted on truck.



Pressure gun for mechanical application of plastic refractories shown in use on rotary kiln.

troweled applications might fail to hold.

Extension nozzles up to 20 ft. in length make it possible to hot-patch spalled or burned-out furnace or kiln lining, frequently without requiring a shutdown. In the case of rotary kilns it is not necessary to cool the kilns before making the repairs. The gun consists of a cast-iron machined cylinder from which the material is forced by pressure applied to the piston. It is mounted on three wheels so it can be easily moved around but a locking device anchors the gun when the handle is erect. The gun has a capacity of 2-cu.ft. of mixed refractory material which will cover 100 sq.ft. with a coat ¾ in. thick.

New Rig Allows Drilling at Any Desired Angle or Position

The Cleveland Rock Drill Co., Cleveland, O., makes a DR6 drill rig which can drill at any desired angle and in any position. Eighteen exclusive features are claimed among which are built-in jack; standard road gage; tubular frame

Air drill rig which can operate at any desired angle or in any position.

utilized as a receiver which acts as a pulsation compensator; air filtering of water, grit and trash; feed cylinder mounting on any part of the frame; continuous and automatic air feed; no separate drill hoist; centralizer which keeps the steel in line when starting a hole. This drill is said to have all of the features of the WD rig made by this company plus the added feature that the feed cylinder can also be swung about a complete circle from side to side.

Traylor Offers New Rotary Clinker Cooler and Burner

Developments in new equipment offered by the Traylor Engineering & Mfg. Co., Allentown, Pa., include the Traylor-Cheesman patented rotary clinker cooler and the Traylor-Cheesman patented burner. The Traylor-Cheesman cooler is a compact unit of the three pass type, that is said to assure cooling of clinker to within at least 100 deg. of atmosphere, with full recovery of the heat contained in the clinker. Air introduced into the cooler travels counterflow with the clinker and is in intimate contact with the heat transfer elements. Two basic elements of heat transfer are utilized, namely, high velocities of gases, and ample heat radiating surfaces, in order to make the cooler very compact. The cooler is completely enclosed within the shell, and is accessible. Due to the distribution of the loads, a minimum of power is required for driving.

In a Traylor-Cheesman cooler and burner installation only one fan is required and very little attention is needed for controlling the air. When a Traylor-Cheesman burner is operated in connection with a Traylor-Cheesman cooler, all of the air required for cooling is used in the kiln for combustion.

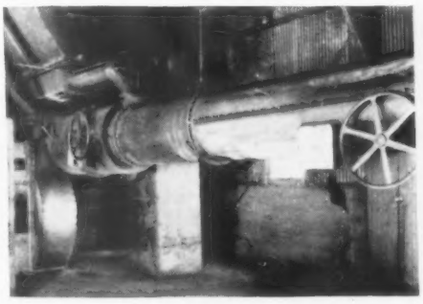
The clinker is spouted into a brick-lined cylindrical chamber provided with lifters to shower the material, which then enters three of six flues formed in the annular space between the outer shell and a center tube, at the lower end of the cooler. The clinker moves through these flues to the ends, at the discharge end of the cooler, where it is spouted into the center tube, which is provided with spiral lifters to cause the clinker to move toward the feed end. At the forward end of this tube the material is spouted into the other three, or "cold" flues, in which it again moves toward the discharge end. At the lower end of these flues the clinker is discharged into an annular trough built with lifter buckets which elevate it into a fixed discharge spout. The six flues are fitted with lifters, and chains to hasten transfer of the clinker heat to the air.

The air moves through the cooler counter-current to the clinker, in order to maintain a constant temperature differential, thereby assuring a uniformity in the physical condition of the clinker. Thus the air is gradually heated and attains its highest temperature when passing through the brick-lined receiving chamber, whence it is drawn into a cyclone and thence blown into the kiln burner. The brick-lined chamber is about half the length of the cooler, but due to the three pass arrangement in the lower half of the shell the air travels about twice the length of the cooler. Also, the velocity of the air through the flues, where the temperatures are comparatively low, is very high, resulting in rapid and efficient heat exchange.

The interiors of all of the flues are accessible from the discharge end of the cooler, the three "cold" flues being open while the three "hot" flues are provided with manholes. A sectional head forms a partition between the brick-lined receiving chamber and the three "cold" flues and the center tube.

Ports and spouts are provided to direct the clinker into the center tube and other ports are located at the upper end of this tube to discharge the clinker into the three "cold" flues. Deflectors fitted into the upper ends of the "cold" flues direct the clinker to the discharge end of the cooler. The center tube and the partitions that form the six cooling flues in the annular space surrounding the center tube, are of such design and assembled in such manner as to permit free expansion and contraction, due to changes in temperature, without damage or distortion of the cooler.

The Traylor-Cheesman patented burner is adaptable for pulverized coal, gas or

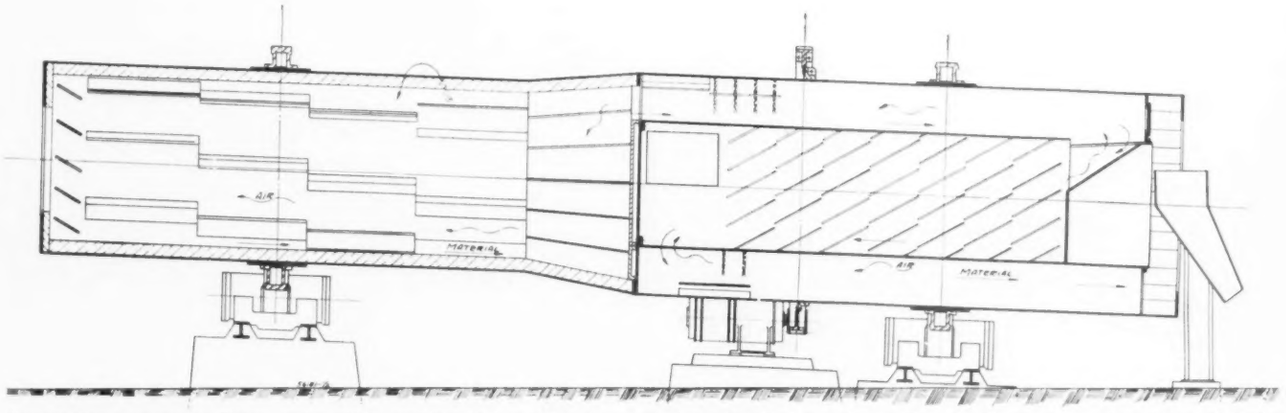


New Traylor-Cheesman burner which gives complete control of air and combustion in kiln.

fuel oil. In this device, all of the heated air from the clinker cooler supplies from 70 to 90 per cent. of the total quantity of air required for complete combustion of the kiln fuel. This hot air is drawn from the connection between the kiln hood and the cooler. It passes into an adjustable cyclone where excess clinker dust is taken out. A fan draws the cleaned gas from the cyclone and blows it into the burner. Further, fuel may be introduced with either the primary or secondary air, depending on furnace conditions.

The burner is provided with adjusting devices in order that the primary and secondary air blasts may be varied. The tip of the inside burner tube is also adjustable, making it possible to obtain any desired flame and giving the operator complete control of combustion. The operator has at all times a clear view of the interior of the kiln, enabling him to adjust the flame to requirements.

The heated air from the cooler may have a temperature as high as 900 deg. F., or more, and all of this heat passes



Traylor-Cheesman rotary clinker cooler which combines high velocity of gases and ample radiating surfaces. Drawing illustrates complicated flow of clinker and counterflow of air.

through the burner, thus attaining high economy. The flame is luminous, affording rapid transfer of the heat to the material being burned.

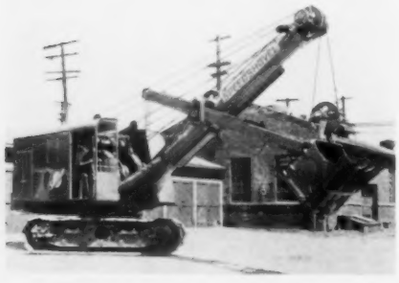
The burner is of double tube design. The inside tube carries the primary air, while the annular space between the inner and outer tubes is for the secondary air. Each of these conduits is provided with a separate regulating valve so that the quantity of air passing through each can be minutely controlled. The levers for these valves are fitted with quadrants so as to enable locking them in place.

The inner burner tube is fitted with a longitudinally adjustable sleeve at the flame end. This is adjusted from the outside by means of a lever, and the shape of the flame is regulated by changing the position of the sleeve. The fuel is introduced through the center tube.

The burner tube extends into the hood, the front of the hood being provided with an opening to receive it. The tube is so constructed that it may readily be removed and permit of the withdrawal of the fire hood to obtain access to the interior of the kiln without disturbing the regulating valves or the fan.

New Excavators Embody Many Improved Operating Features

The new Manitowoc Speed Shovel, Dragline, and Crane, made in one to two cubic yard capacities, embodies many improved features in design and operation. Care has been taken to provide for greater accessibility and perfect lubrication. Some of the major accomplishments include: all gears and other parts are spline fitted to shafts, there being only one press fit throughout the entire machine. All gears and working parts of the machine are fully enclosed and operating in filtered oil circulated under pressure by means of an oil pump.



New shovel which embodies many improved features of design and operation.

The single exposed working gear is the large ring gear and swing pinion.

The simplicity of design is best illustrated by the fact that there are only thirteen gears (including the large ring gear), and one worm gear, in the entire machine when silent chain power take-off is used, and this number is increased by two when helical gear drive is desired. This greater simplicity and smaller number of working parts allows for ample room in the cab.

All motor controls are extended to the operator's station allowing for quick and complete control of the power plant without the operator leaving his station. The patented accelerator control gives variable speed to the motor. This device permits of increasing the power of the motor instantly whenever additional power and speed are required.

An automatic swing lock is a feature on the shovels and cranes, and when the machine is not rotating the rotating bed is automatically locked at any point. A crawler lock that locks both crawlers in either the forward or backward movement is also a special feature. When locked in either direction the machine may be moved in the opposing direction without releasing the lock.

A major improvement is the new style disc swing and reversing clutches. When it becomes necessary to renew the disc frictions, this may be accomplished without removing or dismantling the drive shaft assembly in any way.

The tubular type shovel and crane booms provide for greater strength with less front end weight. The dipper sticks are mounted on the under side of the shipper shaft sprockets, taking advantage of the normal upward pressure of the dipper sticks when operating under load, thus providing full and proper meshing of the sprocket teeth with the racks. This development eliminates the conventional saddle blocks and allows for the sticks to operate on large rollers, which in turn are roller bearing mounted and sealed in grease, only requiring inspection and lubrication annually. Dipper sticks are constructed of Man-ten Steel with internal lattice reinforcing power bars and stiffeners.

The power take-off which provides two operating speeds, making it possible when necessary to reduce the speed of any or all operations by 20 per cent. below the regular or fast operating speed. Oil hydraulic operation of the hoist clutches makes it possible to operate the friction levers by the slightest pressure.

The Chain Belt Co., Milwaukee, Wis., announces the appointment of the Burford-Toothaker Tractor Co., Montgomery, Ala., as exclusive distributors of Rex construction equipment in that territory.

Dodge truck being loaded with gravel to be used in the construction of hangars at the new $8,000,000 Hamilton Field Bombing Base in Marin County, Cal.

MANUFACTURERS' PUBLICATIONS

Centrifugal Classifier. 5 p. (Bull. No. 5. Federal Pneumatic Systems, Inc., Chicago, Ill.) Describes and illustrates the Federal Centrifugal Classifier made by this company.

Vibrating Screens. (The J. S. Morrison Co., Cleveland, O.) A pamphlet describing the new "streamlined" vibrating screen manufactured by this company.

Light Weight Shovels. 15 p. (Bull. 100A. Harnischfeger Corp., Milwaukee, Wis.) Describes and illustrates the new Bantam Weight gasoline, diesel or electric powered shovel manufactured by this company.

Pumps. (Bull. No. 204, The Lawrence Machine & Pump Corp., Lawrence, Mass.) Bulletin describes the High Duty Multi Stage pumps which are especially adapted for high pressure service as for water works, boiler feed and industrial uses.

Welding. 16 p. (Pamphlet 18b, Metal & Thermit Corp., New York, N. Y.) The pamphlet illustrates and discusses the applications of the Thermit welding process.

Shaker. (Ajax Flexible Coupling Co., Westfield, N. Y.). A pamphlet illustrating and describing the Shaler shaker, a new development in the mechanics of screening, grading, and conveying of materials.

Diesel Engines. (Bull. K-204, Cummins Engine Co., Columbus, O.) A pamphlet illustrating the model "K" Marine Diesel engine—4 and 6 cylinders—manufactured by this company.

Self-Aligning Idler. (Folder 1408, Link-Belt Co., Chicago, Ill.) A folder illustrating and describing an idler to keep troughed belts in line.

Buckets. (Catalog 353, Industrial Brownhoist Corp., Bay City, Mich.) The catalog describes and illustrates the complete line of buckets manufactured by this company.

Safety Hats. (Bull. DK-3, The Mine Safety Appliances Co., Pittsburgh, Pa.) The bulletin describes the complete line of industrial protective hats made by this company.

Conveyors. (Sec. 107 of Gen. Catalog 100, Palmer-Bee Co., Detroit, Mich.) This separate section of the catalog illustrates and describes screw and spiral conveyor machinery made by this company.

Pneumatic Separators. (Bull. 25, Federal Pneumatic Systems, Inc., Chicago, Ill.) A bulletin illustrating and describing laboratory and commercial pneumatic dust collecting systems.

Belting. (The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J.) A bulletin describes, illustrates, and gives specifications for Condor Whipcord endless transmission belting.

Safety Devices. (Willson Products, Inc., Reading, Pa.) A catalog illustrating and describing a complete line of safety devices for the head, eyes, nose and throat.

Meters. (Bull. 102, Bailey Meter Co., Cleveland, O.) Describes and illustrates a complete combustion control system which automatically maintains steam pressure, combustion efficiency and furnace draft.

Clam-Shell Buckets. (Jos. F. Kiesler Co., Chicago, Ill.) A pamphlet illustrating and giving specifications of their clamshell buckets.

Long Range Machines. 56 p. (Cat. 17, Sauerman Bros., Chicago, Ill.) The catalog illustrates and describes the entire line of Sauerman Bros. long range machines—drag scrapers, slackline cableways, etc.

Compressor. (Bull. 164, Pennsylvania Pump & Compressor Co., Easton, Pa.) Describes and illustrates the class 3-AT and 4-AT air cushion valve compressors, single-stage, roller bearing type.

Speed Reducers. (Leaflet 2203, Allis-Chalmers Mfg. Co., Milwaukee, Wis.) Describes and illustrates the gearmotors, a compact self-contained speed reducer with integral or attached motors.

Indicators. (Ripley Mfg. Co., Wayne, Mich.) Describes and illustrates the automatic bin level indicator made by this company.

Single I-Beam Cranes. (Harnischfeger Corp., Milwaukee, Wis.) A folder illustrating the single I-beam cranes.

Arc Welder. (Harnischfeger Corp., Milwaukee, Wis.) A folder illustrating the different types of single-control Hansen arc welders made by this company.

Pneumatic Tires for Wheelbarrows and Industrial Trucks. (B. F. Goodrich Co., Akron, O.) A booklet illustrating, outlining advantages and giving specifications of tires for various industrial uses.

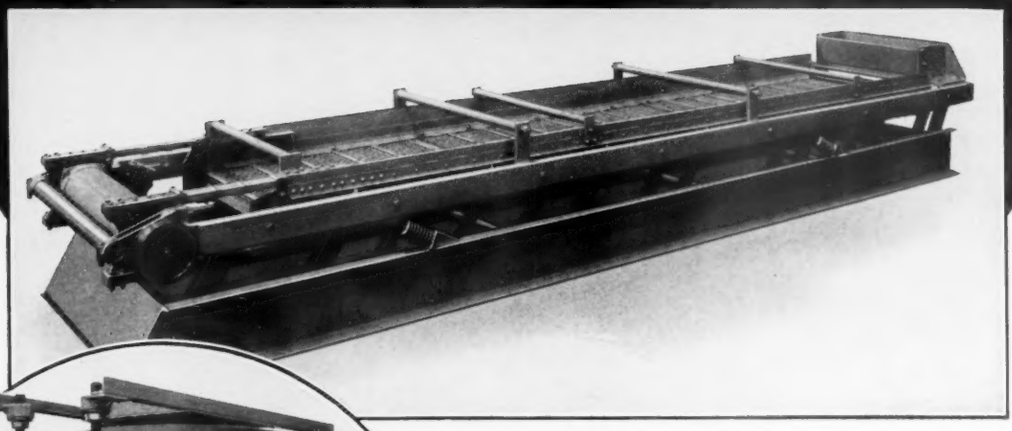
Crushers. (Bull. 110, C. G. Buchanan Co., Inc., New York, New York.) Describes and illustrates the Birdsboro-Buchanan all-steel type "C" crushers.

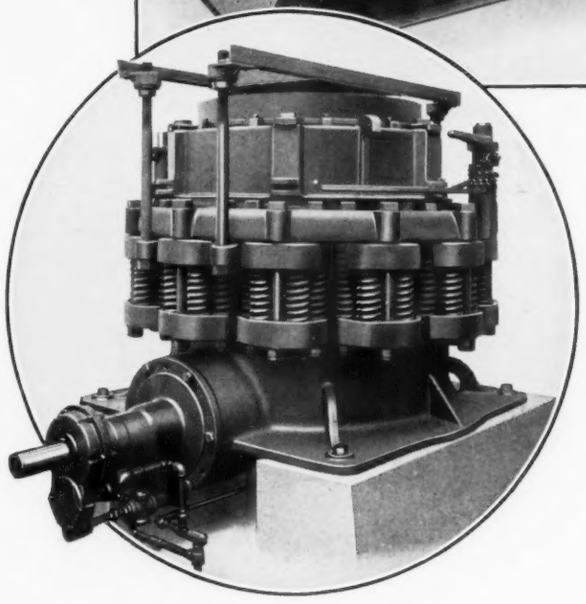
Turbine Pumps. (Bull. 16-B, Pomona Pump Co., Pomona, Calif.) Describes and illustrates the many types of turbine pumps manufactured by this company.

Ball Bearings. (The Imperial Electric Co., Akron, O.) A bulletin giving information on the care and lubrication of ball bearings, especially in electrical machinery.

Screens. 7 p. Bull. 1474-A, Allis-Chalmers Mfg. Co., Milwaukee, Wis.) Describes and illustrates the Aero-Vibe screens in both the single and double deck type.

SYMONS CRUSHERS AND SCREENS





Better Materials at Lower Cost

• • • •

Here is the combination that will produce them

• The Symons Cone Crusher was developed to meet the demand for finer crushed materials produced in quantity at lower cost. Today, because of its widespread use among the leading producers of such materials, it has become recognized as standard equipment for modern crushing plants. If fine crushing is desired, Symons Cones will do it.

• Now that better screening is required, this need is filled by the Symons Screen. Here is a screen that sets level, it has an entirely different screening action and its performance is such that the most rigid specifications can be met. By using Symons Crushers and Screens, better quality of materials can be secured and at a cost that will reflect in greater profits.

For further information on Screens and Crushers write for Bulletins TU65 and TU66.

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Bush House

LOS ANGELES, CALIF.
Subway Terminal Bldg.

Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

Although every effort is made to insure accuracy and completeness in these listings, the publisher cannot accept responsibility for errors or omissions. Any mistakes discovered will gladly be rectified, if brought to the attention of the Advertisers' Service Department.

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*Hardinge Co.

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Gardner-Denver Co.

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*Austin-Western Road Machy. Co.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
New Holland Machine Co.
Nordberg Mfg. Co.
Smith Engr. Works
Universal Road Machy. Co.

Crushers (Roll)
*Allis-Chalmers Mfg. Co.
*Austin-Western Road Machy. Co.
Bonnot Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
*Link-Belt Co.
McLanahan and Stone Corp.
New Holland Machine Co.
*Robins Conveying Belt Co.

Crushers (Rotary)
*Allis-Chalmers Mfg. Co.
*Austin-Western Road Machy. Co.
Bonnot Co.
New Holland Machine Co.

*** See also information in the 1935 Pit and Quarry HANDBOOK.**

New!

More Capacity!

Lower Costs!

Positive Uniformity!

Greater Efficiency!

The capacity of grinding mills is materially increased by this new Gayco Centrifugal Air Separator. Fines are removed as they are made.

It delivers an absolutely uniform product of any fineness desired from 60 to 400 mesh with greater capacity and lower power cost than is possible with any other type of air separator.

It is slow speed, requiring very little power. Repair costs are practically nothing—the only wearing parts are the steel cut gears and bearings enclosed in a dust proof casing.

Send for further details—

RUBERT M. GAY

Division, Universal Road Machinery Company

114 Liberty St. New York, N. Y.

Crushing, Screening, Washing

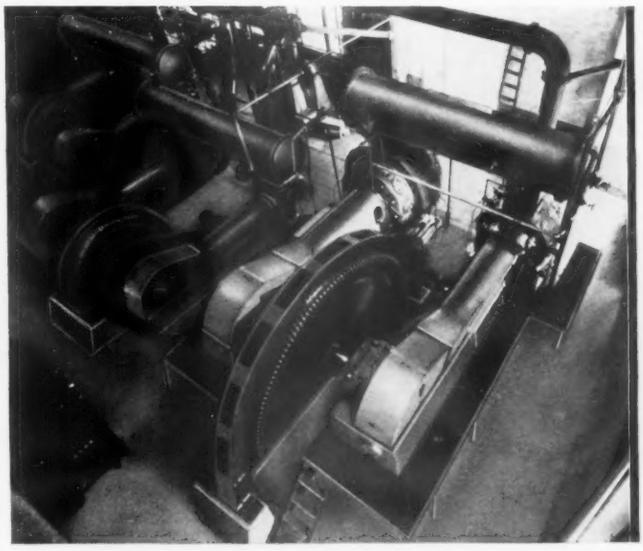
equipment—Reliance—in capacities from 50 to 1500 tons per day. Built with simplicity of design for long hard service with low maintenance costs. Send for catalog and full information.

Universal Road Machinery Co.

Kingston, N. Y.

CP STATIONARY AIR OR GAS COMPRESSORS

Single and two-stage designs; belt, direct-connected motor and steam drive; capacities up to 10,000 c.f.m.; special sizes also available.



ANOTHER! Another "repeat" earned by CP Class "O" Compressors! Previous purchases by a large shipbuilding company included two CP 3500 c.f.m., 600 hp. and several 2200 c.f.m., 350 hp. Compressors. Their performance brought the order for the CP 7500 c.f.m., 1250 hp. Compressor shown with the 2200 c.f.m. machines in the illustration above.

Let CP Compressor users tell you why they "repeat". We shall gladly tell you who they are.

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Sales and Service Branches All Over the World

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AIR & GAS COMPRESSORS • ROCK DRILLS
DIAMOND CORE DRILLS • DIESEL ENGINES
ELECTRIC TOOLS • PNEUMATIC TOOLS
VACUUM PUMPS & CONDENSERS

CHICAGO PNEUMATIC

Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

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Crushing Rolls
*Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
*Austin-Western Road Machy. Co.
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*Kennedy-Van Saun Mfg. and Eng. Corp.
*Link-Belt Co.
McLanahan and Stone Corp.
New Holland Machine Co.

Diesel Engines (See Engines—Diesel)

Dipper Parts
Pettibone Mulliken Co.

Dippers and Teeth (Power Shovel)
American Manganese Steel Co.
Pettibone Mulliken Co.

Doors (Iron)
Smith Wire & Iron Works, F. P.

Dragline Cableway Excavators
*Link-Belt Co.
*Sauerman Bros. Inc.

Dragline Excavators
*Austin-Western Road Machy. Co.
*Harnischfeger Corp.
*Lima Locomotive Works, Inc.
*Link-Belt Co.

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Hetherington & Berner, Inc.
*Morris Machine Works

Drilling Accessories
Chicago Pneumatic Tool Co.
Gardner-Denver Co.

Drilling Contractors
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Mott Core Drilling Co.
Pennsylvania Drilling Co.

Drills (Blast-Hole)
Chicago Pneumatic Tool Co.
Gardner-Denver Co.

Drills (Core)
Hoffman Bros. Drilling Co.
Mott Core Drilling Co.
Pennsylvania Drilling Co.

Drills (Diamond)
Chicago Pneumatic Tool Co.
Hoffman Bros. Drilling Co.
Mott Core Drilling Co.
Pennsylvania Drilling Co.

Drills (Rock)
Chicago Pneumatic Tool Co.
Gardner-Denver Co.

Drill Sharpening Machinery
Gardner-Denver Co.

Drill Steel
Chicago Pneumatic Tool Co.

Drills (Well) (See Drills—Blast-Hole)

Drives (Multiple, Belt, Chain, Rope)
*Allis-Chalmers Mfg. Co.

Dryers
*Allis-Chalmers Mfg. Co.
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*Hardinge Co.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdry. & Mch. Co.
McLanahan and Stone Corp.

Dust Arresters
Dracco Corp.

Dust-Collecting Systems
*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
Dracco Corp.
Raymond Bros. Impact Pulv. Co.

Dust Conveying Systems
*Allen-Sherman-Hoff Co.
Dracco Corp.

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*Allen-Sherman-Hoff Co.

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*Allis-Chalmers Mfg. Co.

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Elevators (See Conveyors and Elevators)

Eliminators (Soft Stone) (See Soft Stone Eliminators)

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*Allis-Chalmers Mfg. Co.
Bonnot Co.
Hetherington & Berner, Inc.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
McLanahan and Stone Corp.
*Robins Conveying Belt Co.
Ruemelin Mfg. Co.
Sprout, Waldron & Co.

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Cummins Engine Co.
Nordberg Mfg. Co.

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Cummins Engine Co.
Nordberg Mfg. Co.

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*Morris Machine Works
Nordberg Mfg. Co.

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*Kennedy-Van Saun Mfg. and Eng. Corp.

Feeders
*Allis-Chalmers Mfg. Co.
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Bonnot Co.
*Hardinge Co.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
*Link-Belt Co.
Morrow Mfg. Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

Fencing (Woven Wire)
*American Steel & Wire Co.
Smith Wire & Iron Works, F. P.

Fire Escapes
Smith Wire & Iron Works, F. P.

Floor Sweeping Systems (Hydro Vacuum)
*Allen-Sherman-Hoff Co.

Forges (Oil)
Gardner-Denver Co.

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*Ensign-Bickford Co.

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Republic Rubber Co.

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Haiss Mfg. Co., Geo.
*Link-Belt Co.

Gears (Herringbone)
*Link-Belt Co.
Sprout, Waldron & Co.

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Haiss Mfg. Co., Geo.
*Link-Belt Co.
Pettibone Mulliken Co.
Sprout, Waldron & Co.

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Lewistown Foundry & Machine Co.

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*Hendrick Mfg. Co.
Ryerson & Son, Joseph T.

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*Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
*Eagle Iron Works
*Hendrick Mfg. Co.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdy. & Mach. Co.
Manganese Steel Forge Co.
Pettibone Mulliken Co.
*Robins Conveying Belt Co.
Smith Engr. Works

Guards (Wire)
Manganese Steel Forge Co.
Smith Wire & Iron Works, F. P.

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Hetherington & Berner, Inc.
Taylor Forge & Pipe Works

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Hoists
Chicago Pneumatic Tool Co.
Gardner-Denver Co.
*Harnischfeger Corp.
Hetherington & Berner, Inc.
Iowa Mfg. Co.
*Link-Belt Co.
McLanahan and Stone Corp.
*Sauerman Bros., Inc.
Smith Engr. Works
Sprout, Waldron & Co.

Hoppers
*Hendrick Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.

Hose (Air, Steam and Water)
Chicago Pneumatic Tool Co.
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Hose (Radiator-Engine Cooling)
Goodyear Tire & Rubber Co.
Republic Rubber Co.

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Idlers
American Manganese Steel Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

Indicators (Bin)
Ripley Mfg. Co.

Kilns and Coolers (Rotary)
*Allis-Chalmers Mfg. Co.
Bonnot Co.
*Hardinge Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

Kilns (Vertical)
*Hardinge Co.

Lime-Handling Equipment
Fuller Co.
*Hardinge Co.
Iowa Mfg. Co.
*Link-Belt Co.
Raymond Bros. Impact Pulv. Co.
*Robins Conveying Belt Co.

Lime and Hydrating Plants
*Hardinge Co.

Lime Kilns
*Hardinge Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

Linings (Ball- and Tube-Mill) (See Mill Liners and Linings)

Loaders and Unloaders
Haiss Mfg. Co., Geo.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Locomotives (Electric, Gas and Steam)
*Lima Locomotive Works

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American Manganese Steel Co.
Manganese Steel Forge Co.
Pettibone Mulliken Co.
Ryerson & Son, Joseph T.

Manganese Steel (Plates and Sheets)
American Manganese Steel Co.
Manganese Steel Forge Co.
Pettibone Mulliken Co.
Ryerson & Son, Joseph T.

Mechanical Rubber Goods
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Mill Liners and Linings
American Manganese Steel Co.
*Hardinge Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

Mills (Grinding) (See also Crushers—Hammer)
*Allis-Chalmers Mfg. Co.
Bonnot Co.
*Hardinge Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Knickerbocker Co.
Lewistown Fdy. & Mch. Co.
Raymond Bros. Impact Pulv. Co.
Sprout, Waldron & Co.

Motors and Generators
*Allis-Chalmers Mfg. Co.
*Harnischfeger Corp.

Motors (Internal-Combustion) (See Engines — Internal-Combustion)

Nails
*American Steel & Wire Co.
Ryerson & Son, Joseph T.

Netting (Locomotive Stack)
Smith Wire & Iron Works, F. P.

Nozzles (Gravel Washing)
*Deister Concentrator Co.

Nozzles (Hydraulic) (See Guns—Hydraulic)

Nozzles (Spray)
*Deister Concentrator Co.

Packings
Goodyear Tire and Rubber Co.
Republic Rubber Co.

Partitions (Wire)
Smith Wire & Iron Works, F. P.

Paving Mixers
Jaeger Machine Co.

Perforated Metal Plates
*Allis-Chalmers Mfg. Co.
Chicago Perforating Co.
*Hendrick Mfg. Co.
Morrow Mfg. Co.
Ryerson & Son, Joseph T.
Sprout, Waldron & Co.
*Wickwire Spencer Steel Co.

Pipe, Dredge (Floating and Shore)
Taylor Forge & Pipe Works

Pipe Flanges
Hetherington & Berner, Inc.
Ryerson & Son, Joseph T.
Taylor Forge & Pipe Works

Pipe Forms (Concrete)
Quinn Wire & Iron Works

Pipe Machines (Concrete)
Quinn Wire & Iron Works

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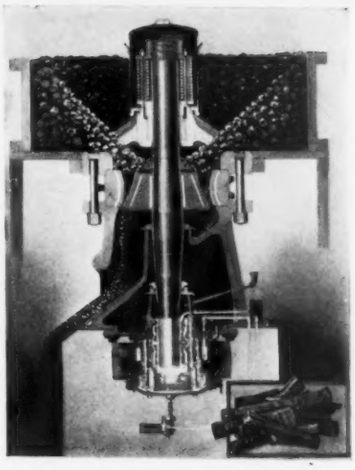
Portable Conveyors
Haiss Mfg. Co., Geo.
Iowa Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Portable Crushing and Screening Plants
*Austin-Western Road Machy. Co.
Iowa Mfg. Co.

*** See also information in the 1935 Pit and Quarry HANDBOOK.**



GREATER TONNAGE with HALF THE POWER COST *Guaranteed!*

THE Kennedy Ball Bearing Gearless Gyratory Crusher is guaranteed to produce a greater tonnage than any other crusher of a given size, with half the power per ton of ore. This crusher can be equipped with a synchronous motor in its pulley, or driven by flat or V-belt from a standard motor.

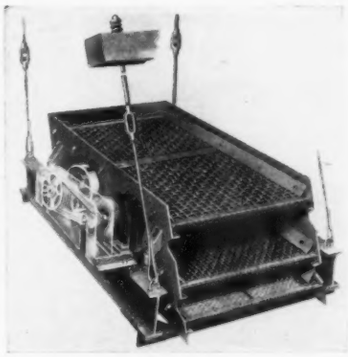
The Savings Effected with this crusher are astounding:

In cost of Maintenance.....80%
In Power.....The entire cost of crusher and motor in pulley is amortized annually.

Sieving test on glacial gravel crushed at the rate of 18 tons per hour, with No. 19 crusher set to ⅛ in., and using less than 15 hp., follows:

Minus ⅜ in.	100%
Plus 3 mesh	21½%
Minus 3—Plus 4	17%
Minus 4—Plus 14	36½%
Minus 14—Plus 48	15%
Minus 48—Plus 100	4%
Minus 100	5½%

KENNEDY VIBRATING SCREEN



Built in open or enclosed types, in widths ranging from 3′ to 6′ with one or more decks. It can be suspended, or supported from the bottom.

Suitable for scalping oversize from primary crushers, as well as smaller sizes, and chemical products.

The entire screening surface is effective, thereby insuring greatest capacity.

Equipped with self-aligning main bearings which account for low power consumption and also for long life of bearings.

Screen drive shaft is positioned near the feed end for balancing purposes and is patented.

Write today for our Catalog No. 16-P-935

KENNEDY-VAN SAUN MFG. & ENG. CORP.

2 Park Avenue New York, N. Y.

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IF YOU WANT MORE DAILY YARDAGE—USE GARDNER-DENVER UNIVERSAL MOUNTINGS

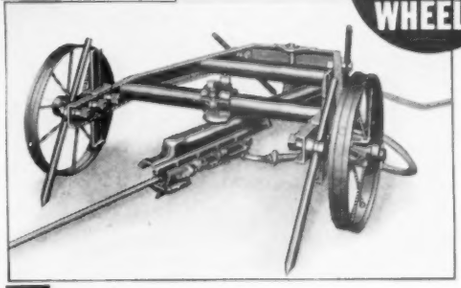
Daily yardage goes up—monthly estimates increase—when you use the Gardner-Denver Universal Mounting. This "Tripod-on-Wheels" greatly speeds up drilling of downholes... snake holes... toe holes and holes close to the face or heading... allows you to take *full* advantage of tripod drill speed. Any type or size of Gardner-Denver drill with standard screw feed guide shell can be used on the Universal Mounting, or on the Two-to-One Pneumatic Feed. Let us demonstrate the time-saving facts—on your job.

GARDNER-DENVER COMPANY

Since 1859

102 Williamson St. Quincy, Illinois

Gardner-Denver Universal Mounting



Gardner-Denver Two-to-One Pneumatic Feed

- **Easily adjustable post and arm to swing drill into position for drilling at any angle.**
- **Wheels quickly adjusted to compensate for uneven ground.**
- **Steady points prevent movement of mounting while drilling.**
- **Simple, sturdy construction to stand hard use.**

GARDNER-DENVER

Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

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Sprout, Waldron & Co.

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*Hardinge Co.
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*Hardinge Co.
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*Morris Machine Works

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*Allen-Sherman-Hoff Co.
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Hetherington & Berner, Inc.
Kansas City Hay Press Co.
*Morris Machine Works
Pettibone Mulliken Co.

Pumps (Dredging)
*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
Hetherington & Berner, Inc.
*Morris Machine Works
Pettibone Mulliken Co.

Pumps (Sand and Gravel)
*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
Hetherington & Berner, Inc.
Kansas City Hay Press Co.
*Morris Machine Works
Pettibone Mulliken Co.

Pumps (Sump)
Chicago Pneumatic Tool Co.

Pumps (Vacuum)
Chicago Pneumatic Tool Co.

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*Hardinge Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

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*Link-Belt Co.
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Smith Engr. Works

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*Link-Belt Co.
*Sauerman Bros., Inc.

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*Deister Machine Co.
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*Roebling's Sons Co., John A.
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*Wickwire Spencer Steel Co.

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*Allis-Chalmers Mfg. Co.
*Austin-Western Road Machy. Co.
Continental Screen Co.
*Deister Concentrator Co.
*Deister Machine Co.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
*Link-Belt Co.
McLanahan and Stone Corp.
New Holland Machine Co.
Nordberg Mfg. Co.
*Productive Equip. Corp.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

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*Allis-Chalmers Mfg. Co.
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*Eagle Iron Works
Haiss Mfg. Co., Geo.
Hetherington & Berner, Inc.
*Link-Belt Co.
McLanahan and Stone Corp.
Pettibone Mulliken Co.
Sprout, Waldron & Co.

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*Austin-Western Road Machy. Co.
*Harnischfeger Corp.
*Lima Locomotive Works, Inc.
*Link-Belt Co.

Skip Hoists and Skips
*Allis-Chalmers Mfg. Co.
Hetherington & Berner, Inc.
*Link-Belt Co.
*Robins Conveying Belt Co.

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Knickerbocker Co.

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Iowa Mfg. Co.
*Link-Belt Co.

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*Deister Concentrator Co.

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American Manganese Steel Co.
Iowa Mfg. Co.
*Link-Belt Co.
Pettibone Mulliken Co.
Sprout, Waldron & Co.

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Smith Wire & Iron Works, F. P.

Stairs (Mine)
Smith Wire & Iron Works, F. P.

Steel (Alloy)
(See Alloys—Steel)

Steel (Abrasion Resisting)
Ryerson & Son, Joseph T.

Steel (Bars, Shapes, Plates, etc.)
Ryerson & Son, Joseph T.

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*Hendrick Mfg. Co.
Hetherington & Berner, Inc.
Manganese Steel Forge Co.
Sprout, Waldron & Co.

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Haiss Mfg. Co., Geo.
*Link-Belt Co.
*Sauerman Bros., Inc.

Sweeping Systems
*Allen-Sherman-Hoff Co.

Tanks
*Hendrick Mfg. Co.
*Link-Belt Co.

Tanks (Sand-Settling)
Iowa Mfg. Co.
*Link-Belt Co.
Morrow Mfg. Co.
Smith Engr. Works

Testing Sieves and Shakers
*Hendrick Mfg. Co.

Thickeners (Slurry)
*Hardinge Co.

Tire Repair Materials
Goodyear Tire & Rubber Co.

Tires (Truck, Passenger Cars, Tractor)
Goodyear Tire & Rubber Co.

Tools (Drill) (See Drilling Accessories)

Track Equipment
Pettibone Mulliken Co.

Track Shifters
Nordberg Mfg. Co.

Tractors
*Allis-Chalmers Mfg. Co.

Tramways (Aerial)
*American Steel & Wire Co.
*Roebling's Sons Co., John A.

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*Allis-Chalmers Mfg. Co.

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Transmission Machinery
*Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
*Link-Belt Co.

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*Link-Belt Co.
*Robins Conveying Belt Co.

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Jaeger Machine Co.

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Goodyear Tire & Rubber Co.

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*Allis-Chalmers Mfg. Co.

Unloaders (Box Car)
*Link-Belt Co.

Valves (Pump)
Taylor Forge & Pipe Works

Variable Speed Reducers or Transmissions
*Link-Belt Co.

Vibrating Screen Plate
Chicago Perforating Co.
*Hendrick Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.
Morrow Mfg. Co.

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Wagons (Dump)
Le Tourneau, Inc., R. G.

Washers (Sand, Gravel and Stone)
*Allis-Chalmers Mfg. Co.
*Eagle Iron Works
Haiss Mfg. Co., Geo.
*Hardinge Co.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Knickerbocker Co.
Lewistown Foundry & Machinery Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Smith Engr. Works
Universal Road Machy. Co.

Welding & Cutting Equipment
McLean Welded Products Corp.
Ryerson & Son, Joseph T.

Welding Supplies
American Manganese Steel Co.
*American Steel & Wire Co.
Manganese Steel Forge Co.
McLean Welded Products Corp.
*Roebling's Sons Co., John A.
Ryerson & Son, Joseph T.
*Wickwire Spencer Steel Co.

Well Drills (See Drills—Well)

Wheels (Car)
American Manganese Steel Co.
*Eagle Iron Works
Iowa Mfg. Co.
Pettibone Mulliken Co.

Wheel Rims. See Rims—Wheel

Winches and Capstans
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Wire & Cable (Electric)
*American Steel & Wire Co.
*Roebling's Sons Co., John A.

Wire Cloth
Audubon Wire Cloth Corp.
Cleveland Wire Cloth & Mfg. Co.
Manganese Steel Forge Co.
*Robbins Conveying Belt Co.
*Roebling's Sons Co., John A.
Smith Wire & Iron Works, F. P.
*Wickwire Spencer Steel Co.

Wire Rope
*American Steel & Wire Co.
Hazard Wire Rope Co.
*Roebling's Sons Co., John A.
Ryerson & Son, Joseph T.
*Wickwire Spencer Steel Co.
Williamsport Wire Rope Co.

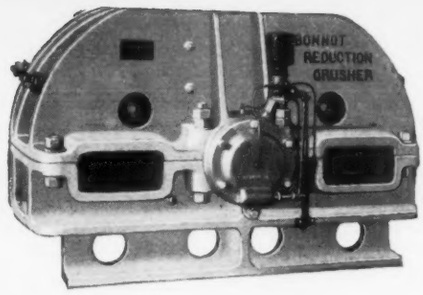
Wire Rope Fittings
*American Steel & Wire Co.
Hazard Wire Rope Co.
*Roebling's Sons Co., John A.
Ryerson & Son, Joseph T.
*Wickwire Spencer Steel Co.
Williamsport Wire Rope Co.

Wire Rope Slings
*American Steel & Wire Co.
Hazard Wire Rope Co.
*Roebling's Sons Co., John A.
*Wickwire Spencer Steel Co.
Williamsport Wire Rope Co.

Wire (Welding)
*American Steel & Wire Co.
Manganese Steel Forge Co.
McLean Welded Products Corp.
*Roebling's Sons Co., John A.
Ryerson & Son, Joseph T.
*Wickwire Spencer Steel Co.

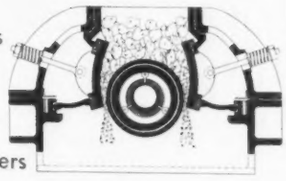
Worm Gears (See Gears and Pinions)

*** See also information in the 1935 Pit and Quarry HANDBOOK.**



BONNOT

REDUCTION CRUSHERS



Manganese Wearing Parts
Reversible Concaves
Cast Steel Frame
Renewable Liners
Bronze Sleeve Bearings
Extra Large Shaft
Positive Pressure Lubrication
Cast Iron Safety Plates

facts!

It is what the users say about the BONNOT Reduction Crusher that counts. Operators everywhere appreciate the advantages of the superior BONNOT design. Facts concerning actual power and lubrication savings, maintenance costs, ability to produce crushed aggregate to specifications, as obtained by users will be furnished upon request. Our leadership dates back to 1891. We share these years of experience with you in offering our recommendations. Your problem will receive our serious and sincere consideration without obligation. Write us today.

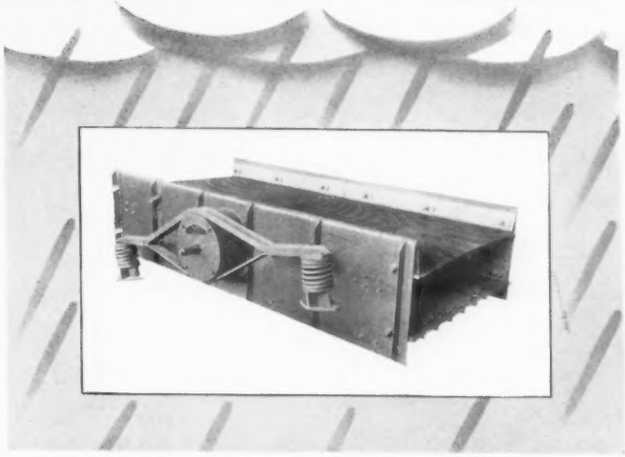
THE BONNOT CO.

CANTON, OHIO

New York Office: 30 Church St.

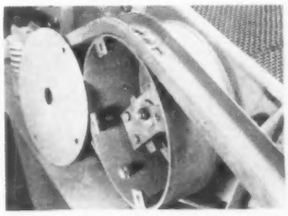
Offices in Principal Cities

SAME YARDAGE WHEN IT RAINS



ROBINS VIBREX SCREENS

They are adjustable . . . adjustable as to pitch as well as to stroke. Damp weather, therefore, does not slow up the user of a Robins Vibrex Screen. A few minutes with a wrench and the screen is set for maximum production, irrespective of the condition of the material. Robins Screens are noted for their substantial construction, low power consumption, high capacity under all conditions, and reasonable prices.



Showing slope adjustment and adjustable Weight Arm.

The Robins engineer will be glad to call and demonstrate the various advantages of Robins Vibrex Screens and other Robins products. If your requirements are unusual, special features will be suggested so that you enjoy the greatest production with lowest costs.

EQUIPMENT ITEMS

Conveyor Idlers
Screens
Belting
Bin Gates
Bucket Elevators
Robins Oro Manganese
Feeders

MATERIAL HANDLING ROBINS EQUIPMENT

ROBINS CONVEYING BELT CO.
15 Park Row, New York City.

I would be pleased to have ( ) Vibrex Screen Book ( ) Gyrex Screen Book ( ) Belt Conveyor Book ( ) Representative Call.

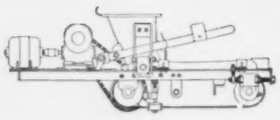
Name .....

Firm .....

Address .....

Town ..... State .....

HARDINGE FEEDERS



Constant Weight Feeders, Volumetric Belt Feeders, Non-Flooding Feeders, Proportioning Feeders, Disc Feeders. Write for Bulletin 33C.

HARDINGE COMPANY
INCORPORATED
YORK, PA.—Main Office & Works Chicago—205 W. Wacker Drive
New York—122 E. 42nd St. San Francisco—444 Market St.

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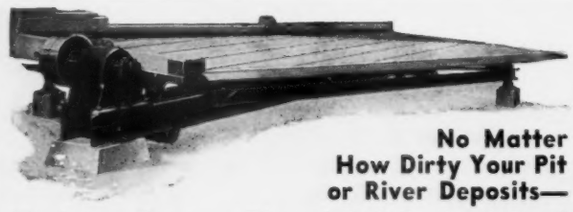
Sauerman Slacklines and Drag Scrapers are designed to dig and convey any distance up to 1,500 ft. at lowest cost per ton.

There is a type of Sauerman machine for under-water excavation, another for digging from a bank, another for stock-piling and reclaiming, and so on. Handling capacities range from 10 to 1,000 tons per hour.

A new descriptive booklet with over 100 illustrations is yours for the asking.

SAUERMAN BROS., 434 S. Clinton St., Chicago



No Matter How Dirty Your Pit or River Deposits—

The Deister Overstrom Diagonal Deck Sand and Gravel Washing Table efficiently removes coal, sticks, clay, debris and contamination from dirty sand and gravel, producing a premium product. Capacity runs 20 to 45 tons per hour depending on size of material treated. Handles fine sand up to 2" gravel.

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911 Glasgow Ave. Incorporated 1906 Ft. Wayne, Ind.
New York Office, 104 Pearl St., New York

HYDROSEAL DREDGE PUMP

Unique principle of hydrosealing both sides of the impeller against abrasive wear, cuts maintenance to a fraction and saves ⅓ in power costs in pumping sand, gravel, rock and other abrasive materials—Estimated economies guaranteed. Sizes 2" to 22", pulley or motor drive. Descriptive Catalog sent on request.

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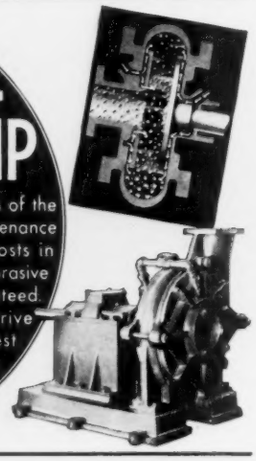
Philadelphia, Pa.



PIT AND QUARRY

Research Department

538 South Clark St., Chicago, Ill.

Please send me catalogs and prices concerning the following items checked below:

- ☐ Agitators, sand and Gravel
- ☐ Agitators, Slurry
- ☐ Air cleaners
- ☐ Air compressors
- ☐ Bag filling and weighing machinery
- ☐ Bags, cloth
- ☐ Bags, paper
- ☐ Balls, steel
- ☐ Barges, steel
- ☐ Belt Dressing
- ☐ Belt fasteners
- ☐ Belting, conveyor and elevator
- ☐ Belting, transmission
- ☐ Belt lacing
- ☐ Belt plates
- ☐ Belt rivets
- ☐ Belt tighteners
- ☐ Bin gates
- ☐ Bins, concrete
- ☐ Bins, steel
- ☐ Blasting supplies
- ☐ Blasting powder
- ☐ Blocks, friction
- ☐ Boots, self-unloading
- ☐ Bodies, Motor Trucks
- ☐ Brake Linings
- ☐ Buckets, Clamshell
- ☐ Buckets, Conveyor and Elevator
- ☐ Buckets, Dragline
- ☐ Buckets, Orange Peel
- ☐ Cableways, Slackline
- ☐ Calcining Machinery
- ☐ Car Dumpers
- ☐ Car Pullers and Move rs
- ☐ Carriers, Belt
- ☐ Cars, Dump
- ☐ Cars, Kiln
- ☐ Castings, Manganese Steel
- ☐ Castings, Steel
- ☐ Chains, Conveyor and Elevator
- ☐ Chains, Power Shovel, Crane and Dredge
- ☐ Chains, Transmission
- ☐ Chutes
- ☐ Classifiers
- ☐ Clips, Wire Rope
- ☐ Clutches
- ☐ Clutches, Magnetic
- ☐ Concrete Plants, Ready Mixed
- ☐ Cones, Washing
- ☐ Conveyors, Apron
- ☐ Conveyors, Belt
- ☐ Conveyors, Pneumatic
- ☐ Conveyors, Screw
- ☐ Conveyors, Skip
- ☐ Coolers
- ☐ Couplings, Flexible
- ☐ Couplings, Hose
- ☐ Cranes, Locomotive
- ☐ Cranes, Overhead Traveling
- ☐ Cranes, Truck
- ☐ Crushers, Cone
- ☐ Crushers, Disc
- ☐ Crushers, Gyratory
- ☐ Crushers, Hammer
- ☐ Crushers, Jaw
- ☐ Crushers, Ring
- ☐ Crushers, Roll
- ☐ Crushers, Rotary
- ☐ Cutter Heads, Dredging
- ☐ Derricks
- ☐ Draglines, Cableway
- ☐ Draglines, Revolving Boom
- ☐ Dredges, Dipper
- ☐ Dredges, Hydraulic
- ☐ Dredges, Ladder
- ☐ Drill Sharpening Machinery
- ☐ Drills, blast hole
- ☐ Drills, Diamond Core
- ☐ Drills, Hand Hammer
- ☐ Dryers, Rotary
- ☐ Dryers, Sand and Gravel
- ☐ Dust Collecting Systems
- ☐ Dynamite
- ☐ Elevators, Bucket
- ☐ Engines, Diesel
- ☐ Engines, Gas
- ☐ Engines, Gasoline
- ☐ Engines, Hoisting
- ☐ Engines, Oil
- ☐ Feeders
- ☐ Filters, Air
- ☐ Filters, Oil
- ☐ Fire Brick
- ☐ Flanges, Pipe
- ☐ Frogs and Switches
- ☐ Fuses, Blasting
- ☐ Gears
- ☐ Goggles
- ☐ Governors
- ☐ Grinding Balls
- ☐ Grizzlies
- ☐ Guns, Hydraulic
- ☐ Hoists, Air
- ☐ Hoists, Derrick
- ☐ Hoists, Drum
- ☐ Hoists, Motor Truck Body
- ☐ Hoists, Skip
- ☐ Hose, Air Stream, Water
- ☐ Hose, Sand Suction
- ☐ Hydrators
- ☐ Kettles, Calcining
- ☐ Kilns, Rotary
- ☐ Kilns, Vertical
- ☐ Linings, Kiln
- ☐ Loaders, Portable
- ☐ Loaders and Unloaders, Box Car
- ☐ Locomotives, Diesel
- ☐ Locomotives, Gasoline
- ☐ Locomotives, Steam
- ☐ Log Washers
- ☐ Measuring Devices
- ☐ Mills, Compartment
- ☐ Mills, Tube
- ☐ Mixers, Plaster
- ☐ Motors, Electric
- ☐ Motors, Gasoline
- ☐ Motor Trucks
- ☐ Motor Trucks, Ready-Mixed Concrete
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- ☐ Nozzles, Gravel Washing
- ☐ Nozzles, Spray
- ☐ Nozzles, Dust Settling
- ☐ Nozzles, Suction Hose
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- ☐ Poidometers
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- ☐ Pulverizers, Hammer
- ☐ Pulverizers, Ring
- ☐ Pulverizers, Rod
- ☐ Pulverizers, Roll
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- ☐ Pumps, Deep Well
- ☐ Pumps, Sand and Gravel
- ☐ Pumps, Slurry
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- ☐ Radiators, Engine Cooling
- ☐ Rails
- ☐ Refractories
- ☐ Respirators
- ☐ Rollers, Conveyor
- ☐ Rolls, Crushing
- ☐ Rope, Wire
- ☐ Safety Appliances
- ☐ Sand-Lime-Brick Machinery
- ☐ Scales, Track
- ☐ Scales, Truck
- ☐ Scrapers, Dragline
- ☐ Screens, Revolving
- ☐ Screens, Shaking
- ☐ Screens, Vibrating
- ☐ Separators, Air
- ☐ Separators, Dry Centrifugal
- ☐ Separators, Magnetic
- ☐ Shovels, Gasoline
- ☐ Shovels, Steam
- ☐ Skips
- ☐ Sleeves, Dredge
- ☐ Slugs and Nuggets, Grinding
- ☐ Speed Reducers and Gears
- ☐ Spray Nozzles
- ☐ Sprays, Paint
- ☐ Sprockets
- ☐ Steel, Tool
- ☐ Stokers
- ☐ Switches, Track
- ☐ Tanks, Concrete and Steel
- ☐ Tanks, Sand Settling
- ☐ Tanks, Wood
- ☐ Thickeners, Slurry
- ☐ Track, Portable
- ☐ Track Shifters
- ☐ Tractors, Crawler
- ☐ Tramways, Aerial
- ☐ Trippers, Belt
- ☐ Trippers, Tramway
- ☐ Unloaders
- ☐ Valves, Pump
- ☐ Washers and Scrubbers, Sand, Gravel, Stone
- ☐ Weighters, Automatic
- ☐ Welding Supplies
- ☐ Wheels, Car
- ☐ Winches
- ☐ Wire Cloth
- ☐ Wire Cloth, Manganese Steel

To be used for .....

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BECAUSE it is the most successful, most satisfactory and most profitable—which fact you can confirm from users, and reason out from reading the Haiss catalogs. Four Standard Haiss Loaders—1 to 5 yds. per minute.

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George Haiss Manufacturing Co., Inc.
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Builders also of HAISS ELEVATORS—SCREENS—CLAMSHELL BUCKETS

They Get the JOBS

..that's why JAEGER TRUCK MIXERS Outsell All Others

Because they offer every facility for the faster delivery of better concrete ("Dual-Mix" action, 1-man chute, dual controls, rapid accurate water tank and patented discharge) Jaeger Truck Mixers get most of the jobs, serve them at lowest cost, and continue to outsell all other makes. Sizes 1 to 5 cubic yards.

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STEEL BELT LACING
NEARLY a thousand belts per hour are laced with Alligator Steel Belt Lacing, day in day out, year in year out. Easy, rapid application with a hammer as the only tool; the hammer-clinched, vise-like grip on the belt ends, preventing friction of the plies; the patented, sectional, steel rocker pin which absorbs friction in the hinged joint; the great surplus of strength and long service—only Alligator Steel Belt Lacing combines these features which make it the choice of millions of belt users. Smooth on both sides. Easily separable. Reliable both on light and heavy duty drives. Eleven sizes. Made also in Monel Metal. Sold at wholesale and retail throughout the world.
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In England at 125 Finsbury Pavement, London, E. C. 2
"JUST A HAMMER TO APPLY IT"
TRADE MARK REGISTERED

Ryerson Abrasion Resisting Sheets and Plates Last Longer

This new type of steel resists wear many times longer than ordinary steel. Write for complete data—also stock list showing steel of every kind, shape, and size. Immediate shipment assured. Joseph T. Ryerson & Son, Inc., Chicago, Cincinnati, Milwaukee, Boston, Detroit, Philadelphia, Cleveland, Buffalo, St. Louis, Jersey City.

RYERSON STEEL

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CENTRIFUGAL PUMPS • DREDGES • STEAM ENGINES

For abrasive mixtures, corrosive liquids, or clear water. Any capacity, head, or method of drive.

For sand and gravel production, water supply reservoirs, filling in, or waterways improvements.

Vertical reciprocating type, single and double cylinders, compound and triple expansion, 3 to 1000 hp.

Write for Bulletins

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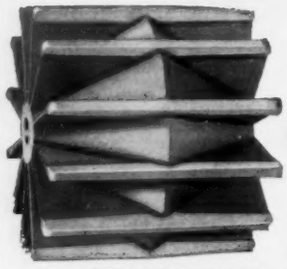
Baldwinsville, N. Y.

ROEBLING
Wire Rope

Wire · Wire Rope · Welding Wire · Flat Wire · Bare and Insulated Wires and Cables · Wire Netting and Cloth.
John A. Roebling's Sons Co., Trenton, N.J.

Branches in JR *Principal Cities*

SAVE YOUR CONVEYOR and Elevator Belts *with* SPROUT-WALDRON Wing Pulleys



Interchangeable with standard pulleys. Nothing can lodge between belt and pulley.

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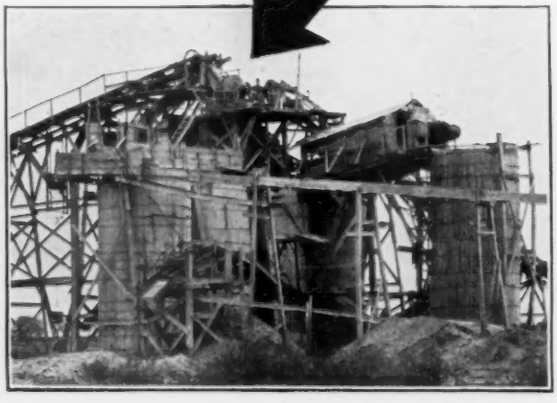
Elevating, Conveying and Transmission Equipment

KNICKERBOCKER Soft Stone Eliminator

This Michigan plant turned an unsalable product into a *profitable* product by using a Knickerbocker Soft Stone Eliminator to reduce a 10% soft stone content down to less than the allowable 2%. If you have a soft stone problem, let us send you details about this installation.

THE KNICKERBOCKER COMPANY
603 Liberty Street Jackson, Michigan

Here it is!



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CRUSHERS—Double roll and Sledge Wedge Crushers, for practically any product. Capacities to 1000 tons an hour.

SUPER DRY PANS—For especially large tonnages.

WASHERS AND SCRUBBERS—Steel log Washers; scrubbers, cylinder washers, sand drags and washing screens.

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JIGS—For concentrating and beneficiating hematite and manganese ores.

SCREENS—Cylindrical and conical screens of any size and capacity.

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Hollidaysburg, Pa.

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are popular in the quarry fields. They wear well. Full range of sizes

Heat-Treated Double-Corrugated Plates

with square, round and "Sqround" perforations. Write for data, particularly on the new "Sqround" Mesh.

Investigate the Weston Testing Screen for making sizing tests.

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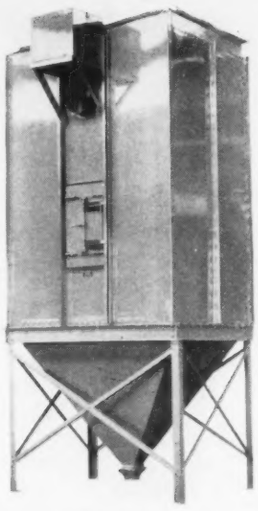
Detroit Hazleton New York Philadelphia Pittsburgh

DRACCO MULTI-BAG FILTERS

Do not have FRAMES or SCREENS

DRACCO MULTI-BAG FILTERS have many features of construction that contribute to Dust Control efficiency as well as Low Initial and Operating Costs. There are no cumbersome frames or screens to be moved in or out of Filter Compartment. Filter Bags seldom require replacing and when necessary, one man can do it,—the change is made on the CLEAN Air Side of Filter; the dust laden side will never have to be entered for making inspections or lubrication.



The NEW DRACCO MULTI-BAG FILTER

You Can Cash In on Our Years of Experience

In solving your Dust Control problems obtain the benefits of our vast experience, for it will pay you in dollars and cents. We will be able to select the proper unit to solve your problem in the most EFFICIENT and ECONOMICAL manner. For valuable information write for Bulletin No. 301.

WRITE FOR BULLETIN NO. 301

DRACCO CORPORATION

Successors to The Dust Recovering & Conveying Co.

4077 E. 116th St. Cleveland, Ohio

10-ton loads for less than 1¢ a mile fuel cost

THE Worden Sand & Gravel Co. reports that their CUMMINS-powered truck saves nearly 4c a mile in fuel cost compared with their same-size gasoline-powered units. . . .

CUMMINS Diesels will give you big savings in *all* mobile and stationary power applications. Get complete facts.

CUMMINS ENGINE CO., COLUMBUS, IND.

The Leader in Diesel Engineering Advancement

CUMMINS DIESEL ENGINES

—The IDEAL Power for Trucks, Shovels, Crushers, Compressors, Pumps, Drills, Etc.

WEAR RESISTER

- **Protects vital parts from wear**
- **Prolongs pump life**
- **Reduces repair costs**
- **Eliminates costly shutdowns**
- **Increases production**

The Wear Resister is the most far-reaching development in dredge pump history—it stops destructive abrasion and gives to Diamond Dredge Pumps a new record of service. It also may be applied to your present pump—let P.M. Co. engineers show you how. Write for Bulletin of the "Wear Resister."

PRODUCTS OF P.M. CO.

Pump Parts:	Dipper Parts:
Shells	Fronts } Black
Impellers	Lips } Patent
Side Levers	Backs

Pumps Complete (Wear Resister) — Dipper Teeth — Dippers Complete—Crusher Parts—Screen Plates.

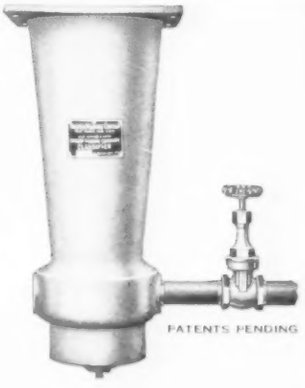
PETTIBONE MULLIKEN CO.

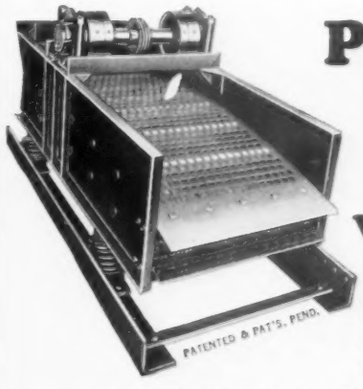
4712 Division St., Chicago, Ill.

COMPOUND FUNNEL CLASSIFIER

For sizing minus 5/16" gravel and sand, and for cleaning it by washing out silt and other light impurities.

Descriptive Bulletin No. 23





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Improved Heavy Duty

VIBRATING SCREEN

Built in all standard sizes and in from one to three decks.

Write for Descriptive Bulletin No. 22

DEISTER MACHINE COMPANY

1933 EAST WAYNE STREET FT. WAYNE, IND.

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SPIRAL PIPE

Stronger gauge for gauge than any other type. Light weight. Low initial cost. Easy to handle or move. Stout and rigid. Smooth, full-flow interior. Available in steel or Armco Ingot Iron. Write for Catalog.

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New York Office: 50 Church Street

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SHOVELS-CRANES-CLAMSHELLS-DRAGLINES
3-4 yd., 1 yd., 1 1-4 yd., 1 1-2 yd., 1 3-4 yd. & 2 yd.
(A TYPE AND SIZE FOR EVERY JOB)

Lima Locomotive Works, Incorporated
SHOVEL AND CRANE DIVISION
Lima, Ohio, U. S. A.

Bigger Yardage and Bigger Profits
With A
Cedar Rapids-Symons Screen
(FOR ALL PORTABLE OPERATIONS)
A BETTER SCREEN FOR ALL SCREENING JOBS
MADE IN A COMPLETE RANGE OF SIZES
Write for Special Bulletin
IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA

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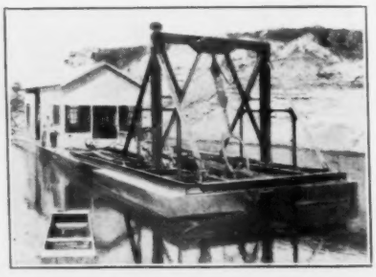
ARE
Performance-Tested
BUCKET ELEVATORS
REVOLVING SCREENS
CRUSHERS DRY PANS
Lewistown Foundry & Machine Co.
Lewistown, Pa.

EAGLE SWINTEK SCREEN NOZZLE LADDER LOWER YOUR COST

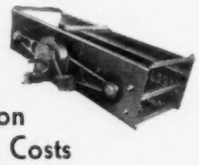


Will eliminate stoppages and slug pumping — insuring an even, constant feed of solids to the suction nozzle — with less power — greatly decreasing the cost per yard of material produced.

Write for descriptive literature and let us tell you how this can be done with your dredge.

Eagle Iron Works
Des Moines, Iowa

Only the **SELECTRO** by JIGGER
GIVES YOU A VIBRATING SCREEN WITH —



1. Selective Vibration, Throw
2. Full Tilting
3. Full Circle Throw
4. Oil—Not Grease—Lubrication
5. Ruggedness, Low Operating Costs

Write for More Information
PRODUCTIVE EQUIPMENT CORP.
210 E. Ohio St. Chicago, Ill.

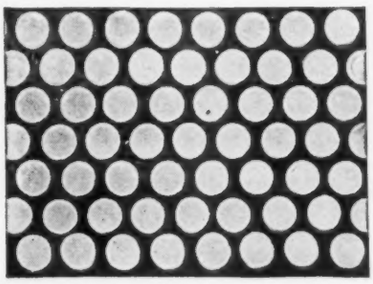
Perforated Metals — Screens of All Kinds — For Sand, Gravel, Stone, Etc.
MATERIAL IN STOCK
PROMPT SHIPMENT
CHICAGO PERFORATING CO.
2435 West 24th Place
Tel. Canal 1459 CHICAGO, ILL.

"Don't ditch it yet"!

Save that old worn-out casting and rebuild it with *work hardened* nickel-manganese steel by the McLean Welding Process. Lasts longer and costs less than new. Write for quotations on rebuilding dipper teeth, pump shells, crusher heads and other equipment.

McLean Welded Products Corp.
Welding Engineers and Contractors
530-32 West 79th Street, Chicago, Ill.

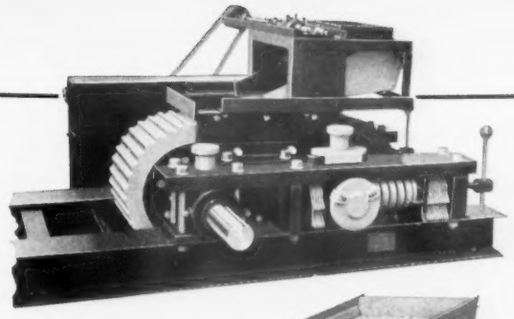
MORROW SCREEN PLATES

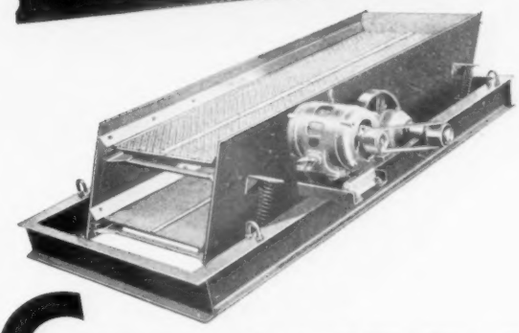


MORROW PERFORATED METAL SCREEN PLATES for sizing and preparing coal, sand, gravel, stone and other bulk materials are made by a Company specializing in screening machinery.

A complete set of punches and dies covering a wide range of sizes, in round, square, oval and diagonal slots are ready for the press, insuring prompt delivery of orders.

The Morrow Manufacturing Co.
Wellston, Ohio





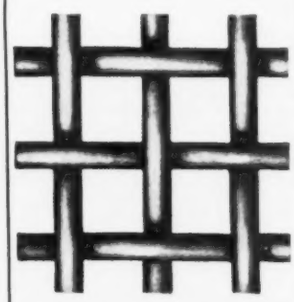
CRUSHERS

that give quick results in production of chips, sand, etc., because of the new type crushing roll for high efficiency operation. A size for every purpose. HEAVY-DUTY VIBRATING SCREENS in one, two and three-deck types, built for making difficult screening easy. Choose NEW HOLLAND equipment for real economy.

WRITE FOR BULLETINS

NEW HOLLAND MACHINE CO.

P. O. Box No. 200 **New Holland, Penn.**



DURO SCREENS
Tough and Economical

Made of a special Spring Steel Wire to resist extreme abrasion and withstand severe vibration.

Write for Bulletin 110

ESTABLISHED 1884

F. P. SMITH
WIRE AND IRON WORKS

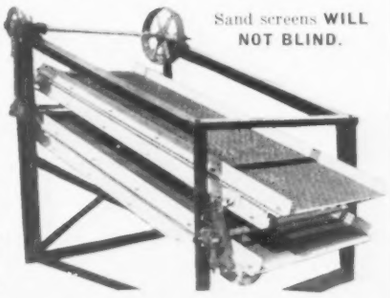
Clybourn, Fullerton and Ashland Aves. and Chester St., CHICAGO

IMPROVED SCREENS—WILL PAY DIVIDENDS

Double your production at half the cost with this new type shaker screen

A. Low first cost.
B. Accurate grading.
C. Greater production.
D. Less power.
E. Low operating cost.
F. Throw adjustment to any degree.
G. Three stages of adjustment in length of stroke.

Screen operates in its own frame. Comes ready to bolt to floor.
2 H.P. runs (4 deck 3x7) 100 yd. P.H.



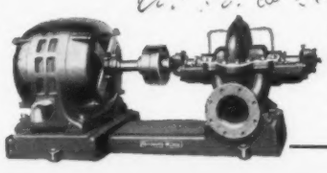
Sand screens **WILL NOT BLIND.**

CONTINENTAL SCREEN CO., KOKOMO, IND.

LIGHTNING
Heavy-Duty (Ball-Bearing) Sand and Gravel

PUMPS

High efficiency — low operating cost—precision workmanship — wear-resisting, non-heating bearings even when operated under extremely high heads.



WRITE

KANSAS CITY HAY PRESS CO.
KANSAS CITY, . . . MO.

QUINN PIPE FORMS
HAND or WET PROCESS

Make concrete pipe on the job with Quinn Concrete Pipe Forms. Get complete information on prices and special construction features of Quinn Forms. Give us size of job for estimate on your pipe form needs.

HEAVY DUTY

Built for more years of service—sizes for any diameter pipe from 12 to 84 inches—any length—tongue and groove or bell end.

MEDIUM DUTY

Makes same sizes pipe as "Heavy Duty" but built to meet demand for lower cost equipment to produce uniform quality in smaller amounts.

Also manufacturers of concrete pipe machines for making pipe by machine process.

QUINN WIRE & IRON WORKS 1627 12 St. Boone, Iowa

GOOD USED EQUIPMENT
Selected Special Items

1—No. 1260 Jeffrey Bakstad Jaw Crusher.
2—36″x54″, 48″x72″ Buchanan Jaw Crushers, all steel, Type C.
2—20″ Superior McCully Gyratory Crushers, short head type.
1—42″ Merrick Conveyor Weightometer.
1—8′8″x85′ Ruggles-Coles Class A Rotary Dryer; Also 2—5′x26′.
1—5-roll Raymond high side Mill.
2—3-roll Raymond high side Mills.
3—5′x50′ Allis-Chalmers Rotary Dryers.
1—8′x125′ Rotary Kiln.
5—6′6″x60′ Vulcan Rotary Kilns.
1—3′x25′ Bonnot Rotary Dryer-Kiln.
1—8′x12′ Oliver Rotary Filter.
1—12′ Gayco Air Classifier.
5—5′x22′ Gates iron-lined Tube Mills.
1—7″x24″ Sturtevant Jaw Crusher, to ½″.
1—36″x36″ Gruendler Hammer Mill, roller bearing, #4XC.
1—36″x24″ Jeffrey type D Hammer Mill.
1—7′ Symons Cone Crusher.
2—20x14, 36x16 Sturtevant Crushing Rolls.
1—30x10 Colo. Iron Wks. Crushing Roll.
1—24″x72″ Magnetic Pulley, complete.
6—Hardinge Ball Mills, 4½x16, 6x22, 6x36, 7x36, 8x22, 8x30.
1—3′x12′ Hendy iron-lined Tube Mill.
2—6′x35′ Louisville hot air Rotary Dryers.
2—6′x45′ Rotary Dryers—MONEL LINED.
8—3x5, 4x5, 4x7 Tyler Screens.
1—4′x8′ Rotex, single deck Screen.
1—305′ 20″ Conveyor, motor, reducer.
1—48″ C/C enclosed Bucket Elevator, 14″ buckets, 3½″ rubber covered 8-ply belt, with motor and reducer.
2—Shepard-Niles Traveling Cranes, 20-ton, 30′ span—10-ton, 24′ span, hand, chain operated.
1—16′ Allis-Chalmers Log Washer.
1—25′ Allis-Chalmers Log Washer.
8—6″ Georgia Iron Works Dredge Pumps.

SEND FOR BULLETIN OF

our regular stock of Crushers; Vibrating Screens; Ball, Rod, and Tube Mills; Air Compressors; Rotary Kilns and Dryers; Hardinge, Ball and Pebble Mills; Raymond and other Pulverizers; Air Classifiers; Thickeners; Wet Classifiers; Filter Presses, Continuous Filters, etc.

CONSOLIDATED PRODUCTS COMPANY, INC.
17-19 PARK ROW, N. Y. C.
Shops and Yards at Newark, N. J., cover 8 acres.

FOR SALE

10 and 35 Ton All Steel Stiff Leg Derricks.
No. 75 Dayton Steam Whirley.
1½ Yd. Bucyrus Electric Shovel.
No. 40 Telsmith Reduction Crusher.
30″ McCully Gyratory—150 H.P. Motor.
10x20, 11x36 Jaw Crushers.
Nos. 30 and 42 American Ring Roll Crushers.
No. 2 Williams Semi-Vulcanite Hammer Mil.
No. 1 Williams Duplex Pony Crusher.
No. 9 Gates K Gyratory.
2—3x6 S-A Double Deck Vibrators.
9x8, 12x10, 14x12 I-R, type ER-1 Compressors.
678′ I-R, type XRB Compressor.
2—118 Foot Gardner XH Compressors.
11x11x12 Loco. type Compressor.
1, 1½ and 2 Yd. Sauerman Cableways.
½, ¾, 1, 2 Yd. Drag Scraper Outfits.
20, 60, 80, 130, 150, 450, 750 H.P. Diesels.
18″, 24″, 36″ Elevators.
8 Ton Tandem 4-Cyl. Gasoline Roller.
12″ Amsco Pump, Belted.
All the above actually on hand, in good condition, ready immediate shipment.
Send for Bulletin No. 93; over 2000 items of excellent used and surplus new Equipment.

Machinery Sales Corp. of America
565 West Washington Boulevard
Chicago, Illinois

FOR SALE

1—12′ Gayco Separator, model 21.
3—Hardinge Mills, 4½′x16″, 5′x22″, 8′x30″.
3—Jaw Crushers 10x7″, 24x12″, 30x60″.
2—Sturtevant No. 1, No. 1½ Rotary Fine Crushers.
1—Sturtevant No. 1 Ring Roll Mill.
4—Gates Gyratory Crushers No. 3D, No. 6D.
5—Traylor Crushing Rolls, 42x18″, 36x16″.
3—Raymond Mills, two roll, four roll, five roll.
6—No. 0000, No. 00, No. 1 Raymond Mills.
2—Rod Mills 5x10′, 4x10′.
2—12″ Traylor Bulldog Gyratory Crushers.
1—Symons 7′ Cone Crusher.
4—Tyler, Sturtevant Vibrating Screens, single and double units.
6—Hammer Mills, Jeffrey, Williams, Sturtevant.

"ONLY A PARTIAL LIST! YOUR INQUIRIES SOLICITED!"

STEIN-BRILL CORPORATION
183 Varick St., New York City, N. Y.

For Immediate Disposal Entire Equipment of the Water Street Trap Rock Co.

1—36″x18″ Farrel "B" Jaw Crusher.
1—24″x13″ Farrel "B" Jaw Crusher.
1—10″x10″ Ingersoll-Rand ER-1 Compressor with 40 h.p. motor and drive.
1—48″x18′ Farrel-Bacon Revolving Rock Screen with assorted jackets.
1—36″x16′ Farrel-Bacon Revolving Rock Screen with assorted jackets.
1—125 h.p. Westinghouse Slip Ring Motor, 220 V—600 r.p.m.
1—100 h.p. Westinghouse Slip Ring Motor, 2200 V—850 r.p.m.
1—40 h.p. GE Induction Motor, 2200 V—1750 r.p.m.
1—5 h.p. Star Electric Induction Motor, 220/440 V—1020 r.p.m.
1—25 KW Allis Chalmers Generator, 250 V—100 amp.—1150 r.p.m.
3—50 KVa Westinghouse Transformers, 2200—220 volts.
2—5 KVa Westinghouse Transformers, 1200/2400—220 volts.
1—Marion No. 7 Gas Electric Shovel, caterpillar mounted, with 1 cu.yd. dipper.
1—P & H No. 206 Gas Shovel, caterpillar mounted, with ¾ cu.yd. dipper, 40′ crane boom and ¾ cu.yd. clam shell, and 1 cu.yd. dragline bucket.
Drills, jack hammers, small pumps, misc. quarrying items.

S. B. MAXIMON
Box 543 Altoona, Pa. Phone 2-2890

Equipment for Sale Cheap

1—Vulcan 40 ton Std. Ga. Saddle tank locomotive.
1—Baldwin 75 ton 6 wheel switcher Oil burner.
1—Marion 1 yd. Steam crane 40′ boom, on cats.
1—Marion 15 ton gas crane 40′ boom.
1—Link-Belt K-2 crane 50′ boom 15 ton capacity.
1—Link-Belt K-44 crane 50′ boom.
1—Browning ⅝ yd. shovel 35′ crane boom.
1—Lorain 75 A 1¼ yd. chain crowd shovel.
1—Universal 7½ ton truck crane.
1—Lambert 3 drum hoist with Swinger Buda gas eng.
1—80 HP. Pennsylvania loco. type boiler.
1—Caterpillar with bulldozer.
1—Monarch 75 Caterpillar with bulldozer.
1—Sullivan 310′ portable compressor.
1—Chicago Pneumatic 220′ portable compressor.
2—Ingersoll-Rand 220′ portable compressors.
1—Ingersoll-Rand pavement breaker.
6—2 wheel concrete buckets.
1—Ransome 27 E paver.
1—7 E Koehring paver self propelling.
2—1 yd. Insley bottom dump concrete buckets.
1—1 yd. Steubner bottom dump concrete bucket.
1—1 yd. Blaw-Knox clamshell bucket.
1—1 yd. Kiesler rehandling bucket.
1—¼ yd. Hayward orange peel bucket.
1—¾ yd. Browning clamshell bucket.
1—⅝ yd. Owen digging bucket.
1—¾ yd. Blaw-Knox bucket.
1—Morris 8″ dredge pump 150 HP. GE. mtr.
1—Morris 10″ cent. pump 2250 GPM @ 130′ head.
1—Goulds 12″ cent. pump 50 HP. GE. motor.
1—Thompson 6″ self priming pump Waukesha mtr.
4—Humdinger 6″ self priming pumps gas motor.
2—Domestic 4″ self priming pumps.
1—GE motor 200 HP. slipring.
1—#7 McKiernan-Terry hammer.
1—#5 McKiernan-Terry hammer.

HARRY C. LEWIS, 325 Frelinghuysen Ave., Newark, N. J.

CLAM SHELL
NEW BUCKETS REBUILT
FACTORY GUARANTEE

SIZES ½ YARD TO 2½ YARD
LOW PRICES — QUICK SHIPMENT

BURT E. ONKST
936 W. Huron St., CHICAGO, ILL.

Jaw Crushers—2″x4″ up to 66″x84″.
Crushing Rolls—12″x12″ up to 54″x64″—Gyratory Crushers.
Ring Roll Mills—No. 0 and No. 1—Swing Hammer Mills.
Rotary Fine Crushers—No. 1, No. 1½, No. 2.
Direct Heat Rotary Dryers—4′x30′, 5′x30′, 5½′x40′ and 6′x50′.
Semi-indirect heat Dryers—4′x30′, 4½′x26′, 5′x30′ and 8½′x75′.
Cement Kilns—3′ up to 8′ diameter.
Hardinge—Marcy & Fuller-Lehigh Mills.
Raymond Mills—No. 00, No. 0 and No. 1.
Tube—Rod and Ball Mills—4′ to 8′ diameter.
Air Separators—3′ and 10′ Gayco—Screens.
Complete drying and asphalt mixing plants.

W. P. HEINEKEN
95 Liberty St., N. Y. Tel.: Barclay 7-7298

For Sale

1—No. 7½ McCully Crusher.
1—No. 6 Smith Crusher.
1—No. 5 Austin Crusher.
1—10″ Superior McCully Crusher.
1—8″ Traylor Crusher.
2—No. 3 Gates Crushers.
1—6″ Superior McCully Reduction Crusher.
1—48″ Symons Horizontal Disc Crusher.
Several Jaw Crushers.
Gas and Electric Motors, 1 HP to 200 HP.
1—Clipper Well Drill.
1—Clyde 2 Drum Hoist, built for 2 Yd. Drag Scraper, with or without motor.
2—Complete Gravel Washing Plants.

LIPPMANN ENGINEERING WORKS
4603 W. Mitchell St. Milwaukee, Wis.

AIR COMPRESSOR

American, steam driven, 600 cu. ft., 2 stage compound, size 11″x12″x12″ and 20″x18″x12″.

METAL STAMPING CO.
11th St. and 44th Ave., Long Island City, N. Y.

FOR SALE

1 complete 10 inch dredge Boat equipped with 40 foot Eagle Swintex Ladder and Amsco Heavy Duty pump.

ARKADELPHIA SAND & GRAVEL CO., INC.
Arkadelphia, Ark.

FOR SALE

2—50-B Bucyrus Diesel Draglines
1—Page Drag Shovel Attachment
1—Clyde Mine Hoist
2—Keystone Skimmers and Backhoes
1—Brownhoist Gas Crane
1—Model 40 Byers Crane
2—Universal Cranes, Truck Mounted
1—Osgood Gas Crane with Backhoe

HERKIMER MACHINERY & EQUIPMENT CO.
667 Herkimer St., Brooklyn, N. Y.

1 135 H.P. Reeves Gas Engine D.C. to 100 K.W.D.C. Generator $1,000.00
1 13x14 Worthington Compressor with 75 H.P. Wagner Slip Ring Motor, Tank-Belt 1,000.00
1 310′ Sullivan Portable Compressor..... 1,800.00
3 Nordberg Power Track Jacks.....ea. 750.00
1 25 Ton McMyler Steam R. R. Crane..... 750.00
1 25 Ton Brownhoist Steam R. R. Crane.. 1,750.00
1 1¼ Northwest Comb. Crane & Shovel... 3,800.00
1 150 Ton Fairbanks Track Scale (New—never been installed)..... 800.00
1 1¼ Model 32 Marion Steam Comb. Crane 1,750.00
10 20 Yard Western all Steel Air Dump Cars .....ea. 600.00
24 6 Yard Koppel 36″ Ga. Dump Cars...ea. 90.00
3 4 Ton Plymouth Locomotives 24″ Ga..ea. 400.00
1 20 Ton Vulcan Gas Loco. 36″ Ga..... 1,500.00
1 50 Ton Plymouth Gas Loco. Std. Ga..... 6,500.00
1 70 H.P. Locomotive Boiler..... 650.00

THE W. T. WALSH EQUIPMENT CO.
3088 West 106th Street
Cleveland, Ohio

"E. C. A. REBUILT" QUARRY AND GRAVEL PLANT EQUIPMENT

AIR COMPRESSORS

Portable and stationary, belt, with elec. or gas. power, sizes from 21 cu.ft. to 1000 cu.ft.

BUCKETS

246—Buckets, all sizes and makes.

CARS

Large lot including std. ga. 6 and 12-yd. and 20-yd., 36-ga. 5 yd. and 24-ga. 1½-yd. Also std. ga. flat cars and ballast cars.

48—Koppel Quarry cars 42" ga. 2½ yd. One way side dump.

CONVEYORS and ELEVATORS

9—Port Belt Conveyors with steel frame, gas or elec. pr. 18 and 24 in. Barber Greene and Chic. Automatic.

1—Stationary: Barber-Greene 18"x 100'.

11—Bucket elevators; 6 Chain Belt Co. and Weller and Link Belt vertical enclosed type; capacities from 35 to 117 tons per hour. 5—Weller inclined type Nos. 3, 4, 5 and 6 up to 170 yds. per hr.

CRANES (Locomotive)

5—Locomotive cranes; sta. ga. 30 and 25-tons; Ohio, Browning, American, Industrial.

1—American 15 ton gasoline powered locomotive crane on 8 wh. MCB trucks, 50 ft. boom. Model 158-G.

CRANES and DRAGLINES

1—Industrial Brown Hoist Type DC 1⅛ yd. Diesel combination shovel and crane with 60 ft. boom; No. 5176.

1—Northwest 104 Dragline, 45 ft. boom, No. 2079, 1¼ yd. bucket.

2—Osgood Nos. 2054, 2069, with 40 ft. boom, 1 with 1 yd. shovel front.

1—Link Belt K-25 ¾ yd. combination shovel and crane, No. 1521, 60 ft. crane boom.

1—Orton Model T No. 49132, 40 ft. boom, 7 ton cap.

1—Industrial Brown Hoist Type CC, No. 5071, 36 ft. boom, ½ yd. bucket.

CRUSHERS AND SCREENS

1—Symons coarse cone crusher, size No. 5½, SD No. 521; capacity 450 tons per hour of 2½" material—130 tons per hour of ½" material; weight 85,000 lbs.

1—Set Power and Mining Machinery Co. crushing rolls, size 42 in. x 16 in., rated capacity 15-20 tons per hour of ⅝" material; weight 41,000 lbs.

1—No. 6 Champion jaw crusher, No. U-1075-4; jaw opening 12"x26"; capacity 24-35 tons per hour of 2" material; weight 20,000 lbs. Like new.

2—No. 3 McCulley gyratory crushers; size of each opening 7"x28"; capacity 25 tons per hour of 2¾" material; 11 tons per hour of 1¼" material; weight 17,000 lbs.

SCREENS

2—Allis Chalmers roller type, all steel, heavy duty, 48 in. dia. by 24 ft. long screen in 3 sections.

2—P & M Roller type, 48 in. by 18 ft. long.

1—Allis Chalmers, roller type 51" dia. by 21 ft. long.

DERRICKS

Steel and wood, stiff leg, or guy; from 5 to 50 tons, including 3 steel stiff legs; 1—20-ton Terry 100 ft. boom; 1—10-ton Insley 80 ft. boom and 1—10-ton American, 80 ft. boom.

DRILLS & DRILL SHARPENERS

3—Gardner Denver wagon or derrick drills with Model 21 or 17 Gardner drills for channelling.

25—Ingersoll-Rand and Sullivan jackhammer column and tripod drills.

HOISTS

Gasoline, electric and steam. All sizes.

LOCOMOTIVES

32—Gasoline locomotives from 14-ton to 2-ton, std. 36 and 24-ga.

1—3 ton 42" ga. Fordson.

1—24-ton Porter steam, saddle tank, cyl. 12"x16" st. ga. Serial No. 5093.

PUMPS

All sizes and types, both force, centrifugal and steam.

SHOVELS

1—Osgood comb. heavy duty 1-yd. gas shovel and crane, No. 2069.

1—Model "00" Thew crawler mounted gas shovel with ½-yd. dipper.

Also Link Belt Shovel attachment for Models K-55, K-44, K-42, K-38 or K-2.

Equipment Corporation of America

PHILADELPHIA
P. O. Box 5419, Kingsessing Sta.
Phone Granite 7600

CHICAGO
1160 S. Washtenaw Ave.
Phone Nevada 2400

PITTSBURGH
P. O. Box 933
Phone Federal 2000

---

2 Bucyrus 2 yd. Diesel Draglines.
Link Belt 1½ yd. Shovel and Crane.
Lima 1½ yd. Shovel and Crane.
7½ ton Universal Truck Crane.
½ yd. Byers Gas Shovel and Crane.
2 Caterpillar 60 Diesel Tractors.
1 Caterpillar 75 Diesel Tractor.
15—3 yd. Koppel V, 36 ga. Dump Cars.
6—14 ton Whitcomb Gas. Locos., 36 ga.
14 ton Whitcomb Std. Ga. Gas Locomotive.
60 HP Portable Firebox Boiler.
750-1250-1800 yd. Asphalt Plants.
Rotex 48x72, No. 18, 2 Deck Screen.
Rotex 36x84, No. 6R, 1 Deck Screen.
Traylor 36x16 Sand Rolls.
Champion 1030 Roller Bearing Jaw Crusher.
Acme 18x11 Model 9½D Jaw Crusher.
Worthington 36x24 Jaw Crusher.
Allis Chalmers 48x36 Jaw Crusher.
3 ft., 5½ ft., 7 ft. Symons Cone Crushers.
18 in. and 24 in. Symons Disc Crushers.
No. 0 Raymond Lime Pulverizer.
6 ft. by 8 ft. Traylor, Tube Mill.
Pennsylvania SX4 and SX6 Pulverizers.
400 KW Busch Sulzer Diesel Generator.
72 KW Worthington Diesel Generator.
Portable Air Compressors: 110-220 & 320' cap.
Orange Peel Buckets: 5 ft. to 48 ft. cap.
1730 ft. Chicago Pneumatic Elec. Air Comp.

Complete Plants Bought and Sold.

R. C. STANHOPE, INC.
875 Sixth Ave. New York, N. Y.

FOR IMMEDIATE DISPOSAL—SAND DREDGING PLANT

1—Steel screening and storage plant, of four—125 cu.yd. capacity hoppers each and four Number 8 Telsmith settling tanks, plant designed to take additional tanks or crushers.

1—25'x40' L.L.Y.P. Dredge.

2—10'x25' L.L.Y.P. Pontoons.

1—10" AMSCO centrifugal pump direct connected to 200 H.P. Electric Motor.

1—50 foot Swinteck Chain Agitator connected to 30 H.P. Electric Motor.

1—Three drum Flory Electric Hoist connected to 22 H.P. Electric Motor.

1—2½" American Marsh Centrifugal Pump connected to 10 H.P. Electric Motor.

1—7½ H.P. Elec. Motor controller and resistance complete 840 R.P.M.

1—10 H.P. Elec. Motor, Squirrel Cage, 1750 R.P.M.

1—14 inch 24'-0" Portable Belt conveyor with Le Roi Gasoline engine.

1—¾ yd. Northwest Gasoline Shovel.

10" pipe, elbows, rubber boots, etc., numerous spare parts for equipment listed.

All Electric motors, 60 cycle, 3 phase, 220/440 volts.

Will sell plant complete or individual units.

PROGRESSIVE SAND AND GRAVEL CO., INC.
P. O. Box 1144, Paterson, N. J.

LOCOMOTIVE CRANES

25-ton Browning 8-wheel, 50' boom.
20-ton Industrial 8-wheel, 50' boom.
15-ton Industrial 8-wheel, 45' boom.
18-ton O&S 8-wheel, 45' boom.

DUMP CARS

5-yard WESTERN 36" gauge heavy-duty (33 of these).
4-yard WESTERN 36" gauge heavy-duty (75 of these).

LOCOMOTIVES

21-ton Vulcan 4-wheel saddle tank dinkey, 36" gauge (4 duplicates).
21-ton Porter, 4-wheel saddle tank dinkey, 36" gauge (2 duplicates).

All equipped with Code Boilers.

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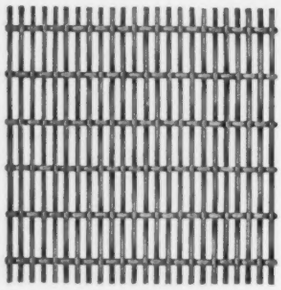

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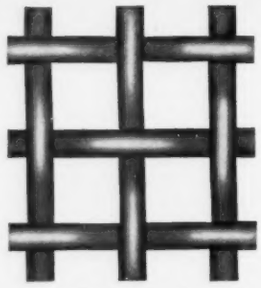

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